UNIVERSITY OF CAPE COAST

THE ROLE OF FISCAL AND MONETARY POLICIES IN THE EFFECTS OF PUBLIC DEBT ON PRIVATE CONSUMPTION IN GHANA

BY

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my original research and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature ……..…… Date ……

Name: Daniel Chris Boakye

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid don by the University of Cape Coast.

Principal Supervisor's Signature …… Date …….

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ABSTRACT

The study examined the role of fiscal and monetary policies in the effects of public debt on private consumption in Ghana using time series data from 1983 to 2021. Estimating the long and short-term relationships between public debt and private consumption, as well as determining the optimum threshold level of public debt on private consumption, the Autoregressive Distributed Lag (ARDL) model and the Threshold Regression approaches were used. The findings of the study indicate that there is a negative relationship between public debt and private consumption in both the short and long run. The study also found that, in the presence of direct taxes, indirect taxes, public debt significantly reduces private consumption in the short run. Also, public debt has an insignificant effect on private consumption below a threshold level of 4.836%, but beyond this level, it causes a significant reduction in private consumption. The study, therefore, recommends that the government cut down wasteful expenditures, maintains manageable levels of public debt, diversify its sources of income. Future research could analyze government policies' effectiveness in managing public debt levels and their impact on private consumption in Ghana.

KEYWORDS

Public Debt

Private consumption

Autoregression Distribution Lag

Threshold Autoregressive

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DEDICATION

To my good friends and family

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LIST OF ACRONYMS

AFRODAD	African Forum and Network on Debt and Development
ATM	Average Time to Maturity
BOG	Bank of Ghana
COVID	Coronavirus Disease
CUSUM	Cumulative Sum
CUSUMQ	Cumulative Sum of Square
DMD	Debt Management Division
DMU	Debt Management Unit
ECOMOG	Economic Community of West African States Monitoring Group
EDS	External Debt Statistics
ERP	Economic Recovery Program
GDP	Gross Domestic Product
HIPC	Highly Indebted Poor Country
ICM	International Capital Market
IMF	International Monetary Fund
LEAP	Livelihood Empowerment Against Poverty
MDRI	Multilateral Debt Relieve Initiative
MOFEP	Ministry of Finance and Economic Policy
MTDS	Medium-Term Debt Management Strategy
WAIFEM	West African Institute of Finance and Economic Management

CHAPTER ONE

INTRODUCTION

Public debt has become a topical issue in Ghana, especially after the debt forgiveness by the IMF under the HIPC initiatives. Knowing its implications on economic growth makes it crucial to understand how changes in the nation's debt levels affect private consumption which is a key factor in determining economic growth. Given that there is little or no empirical study in Ghana demonstrating how public debt affects private consumption, this study aims to provide a thorough examination of such consequences.

Background to the Study

Most countries in the world, over the last half-century have seen significant development in their economies and Ghana is no exception. The main force behind these developments in many countries is the problem of public debt, which empirical studies have largely disregarded (Owusu-Nantwi, 2016). If economic development is to take place, especially in developing countries, investments must be made in infrastructure, education, social welfare, health, and other areas of the economy (Gupta, 2014). Such investments are challenging for countries to finance through tax revenues, which consequently leads to budget deficits. How to finance such budget deficits is therefore the main challenge facing policymakers and the majority of government economists (Van & Sudhipongpracha, 2015). According to Rosen and Gayer (2008), as cited in Owusu-Nantwi and Erickson (2016), developing countries choose debt as the best alternative for financing government budgets when faced with lax tax policies and low earnings.

According to Safdari et al. (2011), taxes are not considered a feasible alternative for settling budget deficits, and the government instead mostly relies on public borrowing (Public debt) to close the difference between what it collects and what it spends. Ogunmuyiwa (2011) asserts that, when tax revenues are insufficient and political leaders are unwilling to jeopardize macroeconomic stability by expanding the money supply, the government is left with the choice of borrowing to pay for infrastructure projects. The situation is not different in Ghana. In Ghana, there is an ineffective tax system and as a result, the nation is unable to obtain enough revenue from taxes to cater for its deficits (Owusu-Nantwi, 2016). By implication, taxes revenues are not a sufficient strategy for funding public expenditures. In addition, according Akoto (2020), the largely informal sector of the Ghanaian economy is untaxed eventhough it forms about 70% of the taxable population. This therefore makes tax revenue inadequate in financing government deficit.

It is therefore not surprising that the country is characterized by rising public debt. According Wani and Kabir (2016), public debt refers to the total borrowing by a country from its domestic environment (internal debt) and foreign environment (external debt). External debt is a stock of money that other countries or international financial institutions loan to another nation over time, as opposed to domestic debt, which is a stock of money that the government borrows from within the country (Elom-Obed et al., 2017). In the quest for stabilizing national economies and promoting global growth, fiscal authorities may take action by taking on the public debt (McLean & Charles, 2018). Large budget deficits have hindered the development of many Sub-

Saharan African countries contributing to high levels of public debt and impeding economic growth (Anning et al., 2016).

In Ghana, before the introduction of the central bank's bill in 1998 to deal with the economy's excess liquidity and provide banks with investment opportunities, the government was unable to borrow on the domestic market to support the budget and was left to rely on the BOG to finance its deficit by printing money. This led to the financial industry failing and huge inflationary pressures on the economy. The primary trend for Ghana's debt burden has been increasing. This suggests an increase as a percentage of GDP from 26.88% in 1983 to 57.58% in 2018, with a minimum of 19.86% in 2006 and a maximum of 181.64% in 2000 (Aimola & Odhiambo, 2021). These statistics demonstrate how transient were the effects of debt relief, which brought this ratio down to 19.86% in 2006.

In 2004 and 2006, through the intervention of the Highly Indebted Poor Countries (HIPC) program and the Multilateral Debt Relief Initiative (MDRI), respectively, the Ghanaian economy benefitted from a reduced public debt. This made the country's public debt-to-GDP ratio decrease from 58.35% in 2003 to 45.02% in 2004 and from 37.20% in 2005 to 26.22% in 2006 (Aimola & Odhiambo, 2021). Despite improvements in public debt ratios brought about by debt forgiveness, Ghana's public debt stock levels have increased, with contributions coming from both domestic and foreign public debt. Ahinsah-Wobil (2018) posits that, even though Ghana has taken part in the HIPC alleviation program, its sovereign debt is still on the ascendency and this makes people worried about its economic growth. This is evidenced by figure 1.0.

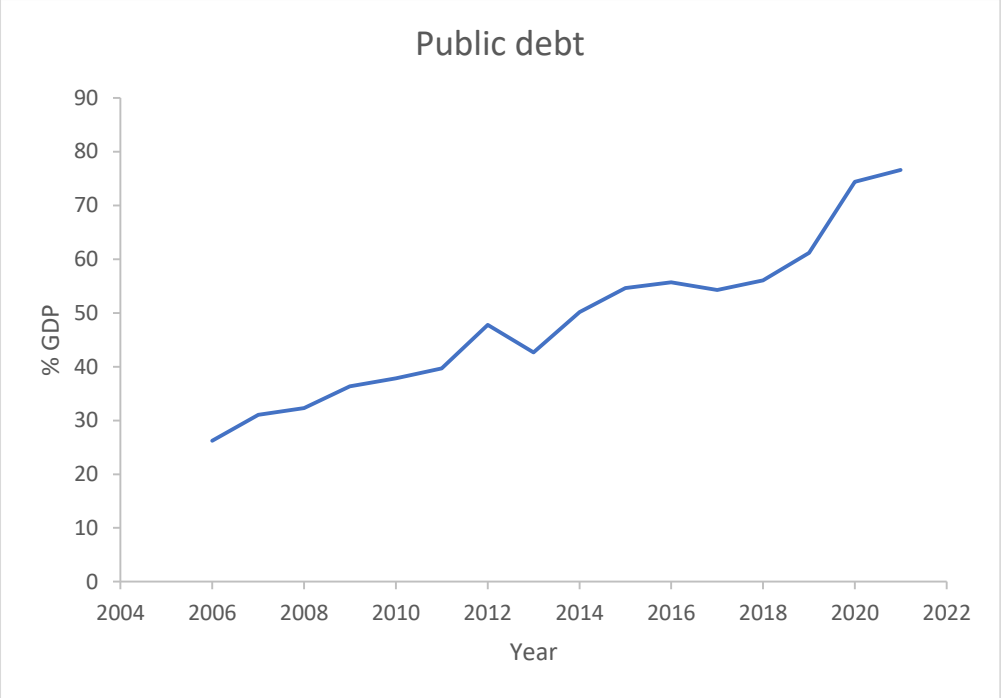

*Figure 1:*Trend of public debt from 2006 to 2021
Source: Author's construct using data from BoG

The graph shows an increase in Ghana's debt stock following the debt relief provided by HIPC and MDRI. The graph demonstrates that after 2006, debt accumulation has considerably grown. The sad reality is that, after benefiting from the debt relief program for a few years, Ghana has returned to its bad situation of enormous public debt. Between 2006 and 2016, Ghana's debt to GDP grew from 26.2 to 73.1%. Even though it dropped to 69.2% in 2017, it increased to 70.7% in 2018. In 2018 alone, the additional debt accumulated was 19.8%. According to the IMF's 2018 review of the extended credit program, Ghana has continuously exceeded the public debt standard of 56% of GDP, and the apparent lack of fiscal adjustment could worsen the public debt profile. The International Monetary Fund (2019) also lists 15 additional African countries, including Ghana, as having a high risk of a debt crisis.

High public debt can potentially undermine SDG 1 (No Poverty) by hindering poverty reduction efforts through reduced private consumption and also lead to unsustainable consumption patterns, which is contrary to SDG 12 (Responsible Consumption and Production). It is against this background that the study seeks to examine how this rising debt of the Ghanaian economy affects the private consumption (welfare) of the people.

Statement of the Problem

Ghana's public debt has been on the increase. Debt service now absorbs a large percentage of domestic revenue, leaving the country vulnerable to shocks. According to the 2022 budget statement presented by the Minister of Finance in Ghana, debt service (which includes principal and interest payments on outstanding loans) is projected to consume about a 47%of total domestic revenue in 2022. This is a significant increase from 32% in 2017. The budget statement also notes that the country's debt stock increased from GHS 122 billion (about USD 21 billion) in 2016 to GHS 332 billion (about USD 58 billion) in June 2021. The country has fallen into a debt trap as real interest rates continue to surpass GDP growth rates, which has forced the country to continue committing more of its tax revenue to service debts.

This continuous rise in the country's debt stock has brought to the fore the need for the government to formulate and implement practical debt management strategies such as domestic debt restructuring and IMF intervention to moderate the effects of the debt on the economy. In effect, Ghana's rising public debt is already placing a significant burden on the economy and society, and the country is at risk of falling back into an

extended debt trap, with economic stagnation and possible increases in poverty rates, and failure to improve the welfare of the people (Jones, 2016).

As is the case in all nations, both fiscal and monetary policies directly influence the socioeconomic conditions experienced by a country's residents, for better or for worse (Wang et al., 2023). However, the intricate interplay between these critical tools of governance in the presence of rising public debt introduces uncertainties that could potentially impact the consumption behaviors and economic security of Ghanaians. Specifically, should rising debt service require revenue generation through tax increases or interest rate adjustments to stabilize credit risks, private consumption might be substantially affected through fewer disposable funds. Yet determining the true nature and magnitude of such effects would require diligent research controlling for multifaceted contextual factors.

However, earlier studies have looked at the effect of Ghana's rising debt on other macroeconomic variables. Studies, in Ghana, on public debt have mostly focused on its impacts on economic growth, inflation, and unemployment. (see Owusu-Nantwi & Erickson, 2016; Anning et al., 2015; Evans, 2022). Other studies on public debt were geared toward testing the existence of Ricardian equivalence (Ofori-Abebrese & Pickson, 2018; Frank & Peter, 2019). To the best of the researcher's knowledge, no study has been done on the relationship between public debt and private consumption in Ghana. To fill this gap, this study seeks to examine the role of fiscal and monetary policies in the effects of public debt and private consumption in Ghana.

Purpose of the Study

The purpose of the study is to examine the role of fiscal and monetary policies in the effects of public debt and private consumption in Ghana.

Research Objectives

Specifically, the study seeks to

1. examine the effects of public debt on private consumption in Ghana.
2. examine the fiscal and monetary policy channels through which public debt affects private consumption in Ghana.
3. determine the optimum threshold effect of public debt on private consumption in Ghana.

Research Hypotheses

1. H_0 = There is no significant relationship between public debt and private consumption

   H_1 = There is a significant effect between public debt and private consumption

2. H_0 = There is no significant relationship between public debt and private consumption through fiscal and monetary policies

   H_1 = There is a significant relationship between public debt and private consumption through fiscal and monetary policies

3. H_0 = There is no optimum threshold level relationship between public debt and private consumption

   H_1 = There is an optimum threshold level relationship between public debt and private consumption

Significance of the Study

This study explores the literature on public debt and private consumption in Ghana. Through comprehensive analysis, the study aims to provide evidence-based insights for policymakers to navigate the challenges posed by rising public debt to consumption levels of Ghanaians while maintaining economic stability. By unraveling the fiscal and monetary policy channales through which public debt affects private consumption, the study aids in optimizing policy approaches that balances developmental borrowing and consumption-driven growth. Furthermore, the study's exploration of the optimum threshold effect of public debt on private consumption enriches our comprehension of the critical levels at which debt becomes detrimental to consumption-led growth, offering policymakers valuable guidance in maintaining fiscal sustainability while ensuring sustained economic activity. The studys also contributes to the body of knowledge and serve as resource information for future studies on the impact of public debt on private consumption. The shortcomings of this study could then be improved upon by future investigation.

Delimitations of the Study

This study focused mainly on the role of fiscal and monetary policies in the effects of public debt on private consumption in Ghana. As such, it relied on annual time series data which spanned from 1983 to 2021. The study limited itself to these periods because of data availability. In orther to achieve the purpose of the study, the auto regressive distributive lag model (ARDL) and the threshold auto regressive model were used. Other materials that were relevant to the study were considered.

Limitations of the Study

Limitations of the study stems from the weakness of the estimation technique employed in the study. The Autoregressive Distributive Lag (ARDL) model, while offering insights into time series relationships, presents several disadvantages. Firstly, its sensitivity to the selection of lag lengths can result in model misspecification, leading to inaccurate parameter estimates and flawed hypothesis testing. Thus, the inclusion of too many lags can lead to overfitting, where the model captures noise rather than meaningful relationships, undermining its predictive capacity. The model's estimators might also exhibit inefficiency, particularly in cases of cointegration estimation, compared to more specialized methods like Fully Modified OLS (FMOLS) or Dynamic OLS (DOLS). Furthermore, the ARDL model's complexity can hinder interpretation and potentially overwhelm researchers, particularly when dealing with multiple lags. Also one of the main challenges with the threshold autoregression model as used to achieve the studys third objective is the selection of an appropriate threshold level. This determination can be subjective and might lead to different results depending on the chosen threshold, impacting the reliability and interpretability of the model.

Definition of Terms

Public debt: the total of a country's debts which includes domestic debts and external debts.

Domestic debt: a stock of funds that is borrowed by the government inside the country.

External debt: a stock of funds lent by foreign countries or international financial institutions to another country at a time

Fiscal policy: Fiscal policy is the use of government spending and taxation to influence the economy.

Monetary policy: Monetary policy is the policy adopted by the monetary authority of a nation to control either the interest rate payable for very short-term borrowing.

Private consumption: the desired amount incurred to meet their basic needs to fulfill their day-to-day life.

Organization of the Study

The study is organized into five main sections/chapters. The first chapter of the study presents a background of Ghana's public debts. It also includes the statement of the problem, objectives of the study, research questions, limitations, and organization of the study. Chapter two of the study presents a detailed review of the literature on the public debt (domestic and external), private consumption, and other relevant variables. This includes both theoretical and empirical literature and how the relationship is peculiar in Africa and Ghana in particular. The third chapter presents an overview of the methodology used to analyze the data. It outlines the technique of estimations and also describes variables and sources of the study used for the study. Chapter four presents a detailed analysis of the data, the results and discussions are also presented here. The fifth chapter gives a summary of results, study conclusssion and also makes recommendations based on the analyzed results and discussions.

CHAPTER TWO

LITERATURE REVIEW

Introduction

This chapter of the study discusses the various literature existing on public debt and private consumption. It spans on the overview of public debt, analyses the conceptual review, theoretical review, and empirical reviews on public debt and private consumption in Ghana. It also reviews the previous studies relating to the role of public debt on private consumption consistent or opposed to theory.

Overview and Trend of Ghana's Public Debt

Ghana's public debt has a long history dating back to the early post-colonial period. Over the past few decades, the level, structure, and management of public debt have undergone significant changes (MOF, 2017). According to AFRODAD (2019), after gaining independence in 1957, Ghana shifted its economy from primarily agricultural to a mixed agricultural-industrial one. The government financed industrial and agricultural projects using foreign exchange receipts and tax revenue. However, due to inadequate resources, the government resorted to borrowing and deficit financing to pay for essential imports and state projects (AFRODAD, 2019). Suppliers' credits were used to fund the purchase of plants and equipment for various projects. The reliance on these credits, which had a short maturity period, resulted in debt problems early in the post-independence development process. The pace of debt accumulation in Ghana was determined by the implementation of these projects and others. External debt increased rapidly from almost nothing at

independence to almost 600 million USD, with more than 80% consisting of suppliers' credits that were due for repayment (AFRODAD, 2019).

In the mid-1960s Ghana was ensnared in debt and rising inflation. The debt burden during this period was partly resolved through debt rescheduling agreements in 1966, 1968, and 1970 respectively. In the 1970s, Ghana did not accrue significant amounts of additional foreign debt as a result of the country being blacklisted by the international financial community following its repudiation of some external public debts (AFRODAD, 2019). In 1983 Ghana accepted undergoing structural adjustment reforms under the guidance of the World Bank and the International Monetary Fund (IMF). In the 1980s, total external public debt was on the increase as a result of the implementation of the Economic Recovery Program (ERP) which had most projects funded by foreign loans. The ERP, among other aims, was designed at enabling Ghana to grow out of its debt and balance of payment problems by boosting exports and attracting foreign direct investment (AFRODAD, 2019). The 1990s witnessed substantial changes in Ghana's public debt, for instance, the total public debt to GDP ratio decreased from 339.7% in 1990 to 142.2% in 1999 with external public debt constituting more than 80.0% of the total debt portfolio (World Economic Outlook Database, 2018). External public debt for this period rose on average by 7.6% annually, fiscal deficit and the corresponding increase in the issuance of domestic debt instruments for domestic debt management policies (AFRODAD, 2019)

In the 1990s, Ghana's total public debt increased substantially by 7.6% and 30.0% per annum for external and domestic debts respectively, with external debt constituting about 85.0% of total public debt (Fosu, 2007).

Domestic debt at lower levels in the 1980s began to rise again in the 1990s (Sowa & Cepa, 2002). The growth in the 1980s and 1990s of Ghana's public debt was a result of mainly new foreign loans for the finance of the Economic Recovery Program projects. By the end of 2000, external public debt stock stood at USD5.58 billion, while the total public debt to GDP ratio stood at 182.2% of GDP, with public debt servicing accounting for 32.0% and 39.0% of total government expenditure in 1999 and 2000 respectively (AFRODAD, 2019)

Before debt relief in 2004, total public debt was characterized by huge external borrowing by the government in meeting its financing needs. This resulted in total public debt stock being largely dominated by external public debt stock (Fosu, 2007). In 2004, under the Highly Indebted Poor Countries (HIPC) initiative, Ghana secured debt relief, which resulted in a 12.5% decline in external public debt stock from USD6.99 billion at the end of 2003 to USD6.12 billion end of 2004. Additional debt relief was secured under the Multilateral Debt Relief Initiative (MDRI) in 2006, which resulted in a 62.6% decrease in external public debt stock from USD6.05 billion in 2005 to USD2.26 billion in 2006 (Africa Development Indicators, 1992, 2001; World Economic Outlook Database, 2018). Despite the overall reduction in external debt stock at the end of 2006 due to debt forgiveness, Ghana's total public debt stock has been on the rise, with increases in both external and domestic debt stock (AFRODAD, 2019).

Subsequently, in 2007, 57.2% nominal growth was recorded in external public debt stock as a result of the issuance of a Eurobond to support the budget, and thereafter, the additional disbursement of loans (Ghana

MTDS, 2016; WAIFEM, 2008). The changes in the external public debt stock component of total public debt stock were also attributed to transactions (disbursements less amortization), and valuation changes due to changes in cross rates among holding currencies and the nascent crude oil production (Fosu, 2007). The contribution of changes in the securitized domestic public debt component of total public debt was large as a result of government financing needs of high fiscal deficit (WAIFEM, 2007). For instance, between 2000 and 2005 domestic public debt stock was well below GHS 2,000 million, but witnessed a sharp increase from GHS 1,823.95 million in 2005 to GHS 2,893.65 million in 2006. The 58.7% stock increase was a result of increased government floatation of short-term, medium-term, and long-term debt instruments (WAIFEM, 2007). In addition, the public debt growth in 2010, 2011, and 2012 of 35.7%, 43%, and 56.5% respectively was also a result of increased short-term, medium-term, and long-term debt instruments in line with the domestic debt management strategy of restructuring the domestic public debt stock from short-term into medium-term securities (Aimola & Odhiambo, 2018).

The growth in domestic debt stock between 2013 and 2017 was a result of continuous domestic borrowings by the government to fund fiscal deficits and refinance matured securities (Amankwah et al., 2018). As of December 2016, public debt stock had increased from GHS100,234.90 (USD26,403.3) million in 2015, to GHS122,263.00 (USD29,227.15) million. In terms of composition, public debt is made up of 44% of domestic debt and 56% of external debt. However, since 2014, external debt has dominated. This was partly due to the country's active presence on the International Capital Market

(ICM) since 2013 to raise funds both for the budget and for liability management operations. The liability management operations were aimed at improving the structure of existing debt to achieve cost savings and mitigate risk (MoF, Annual Debt Management Report, 2016).

At the end of 2017, Ghana's gross public debt stock in nominal terms was GHS142.6 billion (USD 32.3 billion), up from the 2016 amount of GHS 122.3 billion (USD 29.2 billion). However, as a percentage of GDP, it declined from 73.1% in 2016 to 69.85% in 2017 which aimed at improving the structure of existing debt to achieve cost savings and mitigate risk. In terms of debt accumulation, the rate declined from 22.0% in 2016 to 16.6% in 2017. This was on account of prudent Government macro-fiscal and debt management policies. The composition of the public debt showed that external debt constitutes more than 50% of the debt portfolio. The share of external debt declined from 56.3% in 2016 to 53.2% in 2017, whereas that of domestic debt increased from 43.7% to 46.8% over the same. This is because a large part of the budget financing for 2017 was from domestic sources (MoF, Annual Debt Management Report, 2016).

According to the ministry of finance (2018), Ghana's public debt stock in nominal terms as of end-December 2018 stood at GHS173,068.7 million (USD35,888.5 million), comprising external and domestic debt of GHS86,169.0 million (USD17,868.5 million) and GHS86,899.7 million (USD18,020.0 million). External debt and domestic debt accounted for approximately 49.7% and 50.3% of the total public debt stock, respectively, by end-December 2018. The external debt portion dominated policymakers' attention over the years, partly on account of Ghana's active presence in the

ICM and exchange rate depreciation which increased the cedi equivalent amount outstanding. The issuance of domestic debt to support the financial sector bailout, however, significantly increased the share of domestic debt, thus making it dominant in the portfolio by the end of 2018. The overall rate of debt accumulation in 2018 was 21.2%, driven significantly by the costs of the financial sector clean-up. The total nominal gross public debt outstanding as of December 2019 was GHS217,990.7 million (USD39,344.2 million).

According to the ministry of finance (2016), the nominal increase in the total portfolio was due to increases in both the external and domestic components of the debt stock. The increase in the domestic debt was due to net issuances to fund the budget while the increase in the external debt stock was due to the issuance of a Eurobond in March 2019 and exchange rate fluctuations during the year under review on the total stock of debt. The debt-to-GDP as of end-December 2019 was 63.0% from 57.6% in 2018. This ratio includes the costs of the financial and energy sector bailouts. Excluding these bailouts, the provisional public debt-to-GDP ratio as of end-December 2019 was 58.0%. The share of external and domestic debt in the debt portfolio was 51.6% and 48.4% respectively, at the end of December 2019.

In 2020, the debt stock again saw an increase at GHS291,630.7 million (USD50,832.4 million) up from the 2019 stock level of GHS218,228.9 million (USD39,387.2 million). The nominal increase in the total public debt portfolio was on account of increases in both the external and domestic components of the debt stock (MoF, 2020). The increase in the external debt stock by GHS29,049.1 million (USD4,366.4 million) from the 2019 stock of GHS112,747.7 million was primarily due to additional disbursements of loans,

the USD3,000.0 million Eurobond issuance in February 2020, as well as exchange rate fluctuations during the year under review. The much higher rise of GHS44,352.7 million (USD7,078.8 million) in the domestic debt stock in 2020 was mainly due to net issuances of domestic instruments to pay down the cost incurred from the crystallization of contingent liabilities in the energy sector and the financial sector bailout (MoF, 2020). Measured as a percentage of GDP, total public debt increased from 62.4% in 2019 to 76.1% in end-December 2020. A large part of the addition to the debt stock over the period spanning 2018 to 2020 resulted from financial and energy sector bailouts and disbursements related to COVID-19 expenditures. The costs incurred by the Government to clean the impairments in the two (2) sectors resulted in the public debt increasing by 14.7 percentage points of GDP in the same period (MoF, 2020).

In addition, the costs incurred to cover expenses related to COVID-19 resulted in the debt increasing by 4.6 percentage points of GDP in 2020. Excluding the bailouts, the debt-to-GDP was within the Government target of 60.0% for the period 2018-2019. However, the 2020 amount of 69.7%, which excludes the cost of bailouts, exceeded the target. The composition of the total debt stock as of end-December 2020, shows that domestic debt constitutes more than 50.0% of the debt portfolio. The share of external debt declined from 51.7% in 2019 to 48.6% in 2020, whereas that of domestic debt increased from 48.3% to 51.4% over the same period. This is because a large part of the budget financing for 2020 was from domestic sources. (MoF, 2020). Ghana's public debt as of the end of 2021 was GHS351,787.0 million (USD58,640.0 million), comprising external debt of GHS170,009.8 million

(USD28,339.2 million) and domestic debt of GHS181,777.2 million (USD30,300.8 million), respectively. This represents an increase of 19.9% in the nominal stock, primarily on account of additions to both the external and domestic components of the stock.

The domestic debt stock compared to the external witnessed a relatively higher nominal increase, attributable to net issuances of domestic instruments to pay down the cost incurred from the crystallization of contingent liabilities in the energy sector and the financial sector bailout, while the external debt rose mainly on account of disbursements due on new and existing loans, the Eurobond issuance in March 2021, and fluctuations in the exchange rate over the period under review (MoF, 2021). The total public debt-to-GDP ratio increased from 76.1% in 2020 to 80.1% in end-December 2021 This ratio includes the energy sector bailout and financial sector cleanup costs. Excluding these bailouts, the debt-to-GDP stood at 74.1% of GDP. The share of external debt and domestic debt in the portfolio accounted for 48.3% and 51.7%, respectively (MoF, 2021). The overall rate of debt accumulation in 2021 was 20.6%, compared to 33.6% in 2020. This indicates a notable decline in the rate of debt accumulation over the period was on account of the Government's fiscal consolidation program and lower-than-planned bailout costs estimated for 2021 (MoF, 2021).

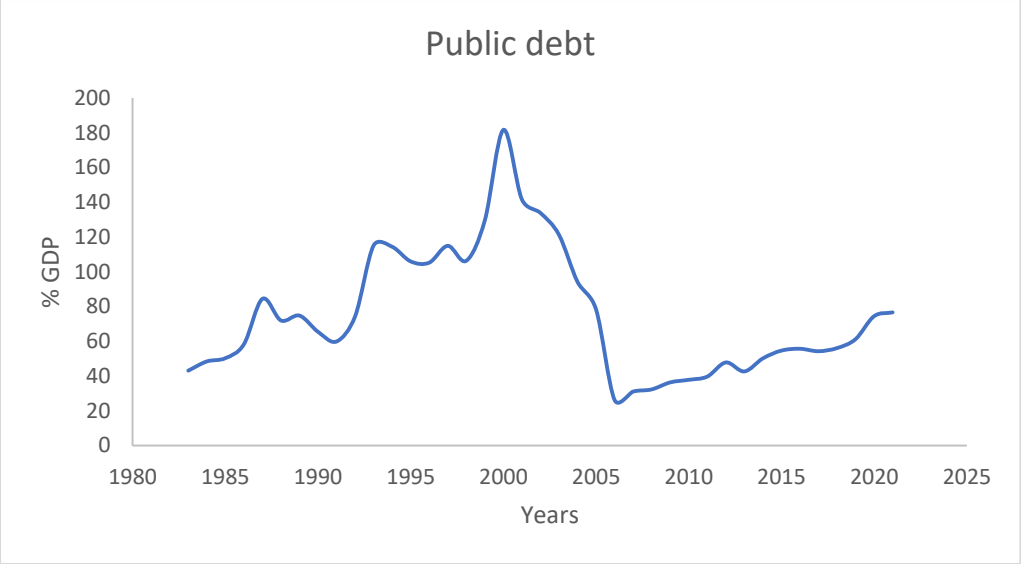

*Figure 2:*Trend of public debt from 1983 to 2021

Source: Author's construct using data from BoG

Figure 1.0 represents the trend of Ghana's public debt since 1983. The trend as shown depicts the overall level of public debt expressed in percentage GDP. The trend shows that Ghana's debt reached its peak in the year 2000. The figure shows that for about a decade in 2000, Ghana's economy suffered its worst performance when real GDP growth dropped to 3.7%. This poor performance was attributed to the deterioration in trade with gold and cocoa, the key export earners of the country, falling as the pride of crude oil- the main import commodity of the country-rose rapidly. The poor overall economic output that led to fiscal imbalances and excessive monetary growth has made external problems even worse, leading to a considerable reduction in private consumption.

It is also shown in Figure 1 that, from the year 2000, the country's public debt saw a reduction through to 2006, and the increased again from 2007 to 2010. This reduction was mainly fueled by the debt forgiveness by HIPC and MDRI. In 2011, the country's debt stock fell but experienced a

surge from 2012 to date. Figure 1 also depicts that from 2019 to date, Ghana's debt stock has increased at an increasing rate. All in all, it is worthy of concluding that the debt level of Ghana, just like the economic development of the country, has witnessed several ups and downs from 1983 through to 2021 as depicted by Figure 1.

The Emergence of Ghana's Domestic debt

Public debt consists of both domestic debt and external debt. Domestic debt has been a topic that is avoided when there's a talk on public debt. It is not only dangerous to borrow overseas but also within the economy. According to Reinhart and Rogoff (2010), domestic debt is huge and accounts for almost two-thirds of the total public debt. If the domestic debt is overlooked, it can pose a huge problem to the private sector since the state borrows from the private sector. In this study, the domestic debt would be included in the public debt to analyze its influence on private consumption.

Causes of Domestic Debt

The need for domestic debt is a result of the government deficit not being able to be fully funded through external borrowing and monetary policy implementation (Panniza, 2008). In general, a deficit involves a change in the government's net assets which can either be financed through the drawing down of assets or incurring new liabilities which could be of domestic and foreign nature. Using assets means the sale of property or reduction in deposits. This type of financing is constrained by the feasibility of privatization and this gives the government the option of borrowing domestically or externally to finance a large part of the fiscal deficits (Panniza, 2008). The choice between foreign and domestic borrowing is based on the

interest rates, the maturity structure, and the risk involved (Anyanwu, et al., 2018).

Most of the Sub-Saharan African countries are resorting to external borrowing since the interest rates are usually below the market interest rates and with a high maturity period (Calderon et al., 2020). These terms of external borrowing are more favorable compared to domestic borrowing. One of the risks involved with external borrowing is the currency risk which can increase along with foreign indebtedness. Beaugrand et al. (2001), however, believe that the best way to finance fiscal deficits is through external borrowing so far as it is available because they are most attractive compared to the high domestic interest rate. Despite the advantages possessed by domestic borrowing, governments may still consider borrowing domestically due to the following reasons.

First, before the government borrows outside, it is assessed by its current Economic performance by the aid agencies' budget which the country may not meet. Secondly, international aid is associated with the financing of capital projects and does not often finance the recurrent expenditure of the government (Beaugrand et al., 2001). If this happens, then governments with large budget deficits are compelled to go into domestic savings which include domestic debt in clearing the budget gaps. Domestic debt is also used in achieving monetary policy targets. This is usually associated with countries with a large balance of payment surpluses which is a result of large aid inflows or export of oil. With this, the foreign exchange increases liquidity which undermines macroeconomic stability. The Central bank hence intervenes by

the sale of government or central bank bills to stem inflationary pressures from too much liquidity.

In Ghana, the evolution of the domestic debt was through fiscal excesses beginning in 1990. Unbudgeted outlays for hosting the Non-Aligned Movement's Ministerial Conference and the peacekeeping operations in Liberia (ECOMOG) in 1990, and later expenditures on district-level elections proved to be too much strain on the fragile economy and the country has not recovered since (Duncan & Magnus, 2011). In the case of the district-level elections, as in all other political expenditures, there were budgeted costs related to the process and unbudgeted costs to influence the process. The fiscal pressures of these unplanned expenditures were exacerbated by the fact that the availability of program aid was very limited in the 1990s and disbursement of project aid had slowed down considerably — not unrelated to the policy failures (Duncan & Magnus, 2011). There was no evidence to support any crowding out of credit to the private sector due to an increase in the holdings of the domestic debt by the commercial banks (Anyanwu, et al., 2018)

Domestic debt is debt owed to people and institutions within Ghana rather than externally. It tends to be owed in cedis rather than foreign currencies, which means its relative size does not increase when the cedi falls in value.

External Debt

The World Bank defines external debt as the debt owed to non-residents and payable in foreign currency, goods, or services. Most countries have a national debt due to normal activity, but some countries accumulate unmanageable levels of debt during economic crises. According to Pattillo et

al. (2002), borrowing at appropriate levels can lead to improved economic growth in developing countries. Soludo (2003) identifies two primary reasons for borrowing: to increase investment opportunities, spending on education and health, or to fund a temporary balance of payments deficit and to reduce interest rates on foreign borrowing or overcome budgetary constraints. In essence, borrowing is done to promote economic growth and reduce poverty. A country's poverty situation may improve if its economy grows by at least 5%. Developing countries such as Ghana with large infrastructural deficits borrow to supplement their limited domestic capital stocks, allowing for investment opportunities that generate higher returns on capital than those in developed countries (Afieff & Alexis, 2010)

The act of borrowing money alone does not guarantee a positive outcome. For borrowing to be beneficial, the borrowed funds, in combination with domestic funds, must be directed towards productive ventures that generate enough service returns and eventually repay the debt (Umaru et al., 2013). This approach results in economic growth, which ultimately helps to reduce poverty levels. When this strategy is employed over an extended period, there is a visible improvement in income per capita, which is a prerequisite for poverty reduction.

The Emergence of Ghana's External Debt

External debt is a form of financing provided by a country, generally in foreign currency from international markets, international organizations, and foreign states on the condition that they are paid back the principal amount with the interest at a set maturity date. In other words, external debt is the flow of capital from developed countries to developing countries to meet their

needs. One of the main problems of undeveloped and developing countries is the weakness of capital accumulation and insufficiency of domestic savings. These countries must resort to external debt to continue economic development processes. In addition, these countries use debt as a tool in the financing of the import of investment goods to carry out necessary investments (Bilginoğlu & Aysu, 2008). In general, the reasons why countries resort to external debt can be attributed to continuous budget deficits, insufficiency of domestic savings and capital accumulation, deficits in the balance of payments, financing of expenditures in extraordinary periods (war, natural disasters, economic depressions) (Sagdiç & Yildiz, 2020; Uygur & Meric, 2013).

Depending on the factors affecting external debt for developing countries, there are different perspectives in the literature. The main factor for external debt accumulation by developing countries is the insufficiency of domestic savings and capital accumulation. Especially the insufficiency of domestic savings leads countries to find external sources. In the long run, this situation causes countries to pay their debts again with new borrowings. Paying the debts with new borrowings (refinancing debts) will also cause the debt rollover ratios in the external debt policies to increase and negative developments in debt management. Economic growth, institutions, financial markets, infrastructure investments, and financing of industrialization related to economic growth are also the main determinants of external debt (Sağdiç & Yildiz, 2020)

By 1970, Ghana transited from a medium-income country to a low income due to the high population growth rate. The desire to industrialize the

economy as fast as possible led to the accumulation of huge debts due to the reliance on borrowed funds to finance the hastened industrialization agenda. The nature of the borrowed funds was fast maturing and hence led to debt payment problems at the early stages of the post-independence development agenda. By the end of 1965, nearly USD600 million worth of external debt was accumulated and was due for repayment. Nevertheless, external factors and the abandonment of the cocoa sector affected Ghana's export earnings and were not able to generate enough revenues to settle the accumulated debts. Therefore, Ghana had to resort to an agreement to reschedule debt in 1966, 1968, and 1970 all in an attempt to deal with the debt repayment crises.

Debt management in Ghana

Public debt management in Ghana as part of the core functions of the Ministry of Finance had evolved in the last decades. The current Debt Management Division (DMD) at the Ministry of Finance owed its origin in the External Debt Secretariat (EDS) that was set up in the early 1970s, located outside the Ministry of Finance, devoid of the Minister's control and supervision. EDS became part of the Ministry of Finance and Economic Planning (MOFEP) in the late 1980s during the Structural Adjustment and Economic Reform era and was named Debt Management Unit (DMU). It was responsible for advising the government on prudent external aid and debt management policy and strategy. By early 2000, the unit was managing the government's total public debt portfolio. Since then, the Division has undergone several changes, eventually becoming a full-fledged Division of the Ministry of Finance in 2004, operating directly under the supervision of the Deputy Minister in charge of Finance (AFRODAD, 2019).

The Minister of Finance has the sole mandate to borrow on behalf of the government of the Republic of Ghana. This mandate is operationally conferred on the Debt Management Division to source, administer and manage public and quasi-public debts, and to develop strategies for effective public debt management. The Division manages total public debt, which includes all financial obligations over which government exercises direct and indirect control. The Division manages and reports on direct government debt and guaranteed debt, which may be categorized into but not limited to, direct government-to-government loans, multilateral loans, trade credits, commercial loans, other structured financing facilities, and all forms of grants with maturities spanning short-term, medium-term to long-term (AFRODAD, 2019).

To safeguard the overarching goal for debt sustainability, and ensure that Government's financing needs and payment obligations are met at the lowest possible cost over the medium to long term, the government adopted the Medium-term Debt Management Strategy (MTDS) for 2016-2018 to provide more cost-efficient access to the international and domestic capital markets (MoF, 2019). The strategy sought to develop the primary and secondary markets for greater efficiency, refinance external and domestic debt to extend tenor and reduce debt service costs. The implementation of these strategies in 2016 has led to some mixed results in the costs and risk factors associated with the debt portfolio (MoF,2019). The Average Time to Maturity (ATM) of the public debt portfolio declined from 6.9 years in 2015 to 6.3 years in 2016, with the corresponding ATM for external debt declining from 10.0%to 9.3%, while domestic debt improved from 1.1% to 1.3% over the

same period. According to MoF (2019), the proportion of debt maturing in a year on the other hand increased from 22.8% in 2015 to 29.8% in 2016. The share of the debt portfolio requiring refixing in one year increased from 33.1% in 2015 to 41.6% in 2016. Government exposure to debt denominated in foreign currency also increased from 58.0% in 2015 to 62.8% in 2016 (MoF, 2019).

But according to MoF (2018), the implementation of the Medium-Term Debt Management Strategy (MTDS) faced significant challenges in 2018 due to external vulnerabilities, which led to investor pull-outs from the domestic market. To address the external contagion effect of the sell-offs in emerging countries, which affected the participation of non-resident investors in the domestic market and put pressure on the Ghana Cedi against major trading currencies, the approved strategy was redirected to focus on increased Government support to the proper functioning of the secondary market. For this, Government had to use its buffers to help improve liquidity and stabilize the market. In fulfillment of section 59 of the PFM law, Government developed a Medium-Term Debt Management Strategy which outlined Government's plan to guide debt management operations spanning 2019-2022 (AFRODAD, 2019).

The financing strategy of the Government in 2019 was in line with its debt management objectives of borrowing at minimum cost, subject to a prudent degree of risk, while promoting the development of the domestic market, continuing the ongoing liability management program to manage the risks in the public debt portfolio, and seeking to diversify currency and investor base. Accordingly, the strategy focused on reducing the refinancing

risks embedded in the debt portfolio through liability management operations and the development of domestic debt markets.

The 2019 debt strategy envisaged the continuous issuance of medium-term bonds (especially 5-year bonds) and longer-date bonds (especially 7-year, 10-year, and 15-year bonds) in the domestic market over the strategy period (MoF, 2019). The strategy assumed a sovereign bond issue of up to USD 3,000.0 million on the ICM, with proceeds of up to USD 2,000.0 million to fund the budget and USD 1,000.0 million to be used for liability management. The strategy also envisaged the issuance of domestic debt against possible contingent liabilities that may arise in 2019 (MoF, 2020). In 2019, Government issued 3-year, 5-year, 6-year, 10-year,15-year, and 20-year bonds using the book-building process to further lengthen the maturity profile of domestic debt. Tap-ins were also done on medium-term instruments and the domestic US Dollar Bond to build benchmark domestic bonds.

In March 2019, Government also issued a total of USD3,000.00 million in three (3) tranches of 7-year, 12-year, and 31-year Eurobonds, priced at 7.88%, 8.13%, and 8.95%, respectively on the ICM. A total of GHS1,490.0 million in bonds (representing 0.43% GDP) was issued by Government to cover the costs of the bailout of financial institutions (MoF, 2020). As part of the Government's efforts to bring debt to sustainable levels, an annual limit of USD750.0 million on commercial borrowing was placed on contracting non-concessional external debt for projects for which concessional financing was not available. This was the first-time debt limits had been applied to the budget. Difficulties faced in the energy sector and unfavorable domestic

market conditions in 2019 presented challenges to the smooth implementation of the strategy (MoF, 2020).

To meet the financing needs of the Government, longer-dated instruments with remaining maturities of less than a year were re-opened. This adversely affected the cost-risk indicators of the public debt portfolio particularly the refinancing risk of the domestic debt portfolio, with domestic debt maturing in a year increasing from 28.4% in end-December 2018 to 31.7% in end-December 2019 (Annual Public Debt Report, 2019)

Private consumption

Private consumption, however, is the desired amount incurred to meet their basic needs to fulfill their day-to-day life. It consists of the market prices of all goods and services purchased by the households to satisfy their basic needs and wants such as food, clothing, housing, transport, etc. A household's decision on how much to consume or save is a microeconomic question as it deals with the individual units of the economy. In most developing countries and particularly Ghana, the government is responsible for the provision of basic social amenities such as toilet facilities, roads, water, electricity, national defense, and law among others. This is due to market failures that occur when the private sector provides these facilities (Mahmud et al., 2012). Another reason is that most developing and low-income countries like Ghana are confronted with issues of low private savings and low investments and so it is incumbent on the government to provide basic infrastructure and social services for its citizens. Therefore, this leads to a rise in public debt since tax revenues are insufficient, and the government has to borrow to cover its expenses. Private consumption in Ghana accounted for 82% of the country's

GDP in 1990 but decreased to 75% in 1996. At the household level, the average annual private consumption in Ghana was GHS 1,918.0 or approximately USD 504.7 per capita in 2008 (GSS, 2007; Bonsu & Muzindutsi, 2017). In 2018, the annual private consumption in Ghana per capita increased to USD 1,583.49 (World Bank, 2020). As per the World Bank (2020), private consumption in Ghana has risen to USD 47,197,112,973.0, representing a 97.43% change. Figure 3 depicts the trend in private consumption in Ghana from 1990 to 2021.

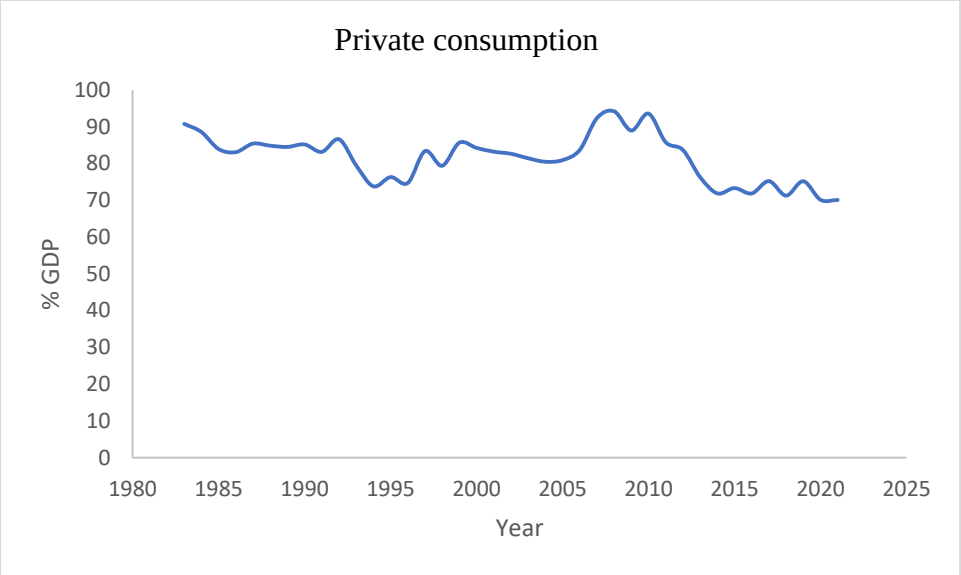

*Figure 3:*Private consumption from 1983 to 2021

Source: Author's Construct using data from WDI

As demonstrated in Figure 3, the highest private consumption was recorded in 2008, accounting for approximately 98% of the country's GDP. From 2010 to 2020, there was a decline in the country's private consumption, which fell to around 70% of the GDP. Despite the decreasing trend of private consumption as a percentage of GDP, the country has introduced several social intervention programs such as the Livelihood Empowerment Against Poverty (LEAP), Capitation Grant, School Feeding Program, free distribution

of school uniforms, elimination of schools under trees, free senior high school education, the establishment of Community based Health Planning Services (CHPS), and national immunization against polio, among others. The objective of these programs is to reduce poverty among the vulnerable population, stabilize private consumption, and enhance the living standards of the people (GSS, 2018).

Theoretical Review

The theoretical models that describe the connection between public debt and private consumption are discussed in this section. They are the Keynesian theory, the Ricardian equivalence theory, the New Keynesian Default theory, the permanent income theory, the absolute income theory, and the life cycle income theory.

Keynesian theory of public debt (1936)

In line with Keynesian theory, borrowing for consumption is considered as beneficial as borrowing for investment expenditure. The theory suggests that an increase in government debt, resulting from deficit-funded fiscal policies, would lead to an increase in income, money demand, and exchange rates. Consequently, the interest rate on bonds would rise with a set money transaction. According to the Keynesian theory, government debt is positively related to development without considering the profitability of public expenditures. The theory also suggests that national debt does not affect consumption, but it withdraws cash from private investors. The borrowing funds are injected back into the economy to stimulate overall demand through wages, salaries, and other capital expenses (Onogbosele & Ben, 2016). This can have implications for private consumption as well. If interest rates rise

significantly, borrowing costs for individuals could increase, potentially leading to a decrease in their disposable income and impacting consumption decisions.

However, the Keynesian theory tends to emphasize the short-term effects and the importance of boosting aggregate demand to counter economic downturns. While the theory suggests that government borrowing can stimulate economic activity through increased spending, it's important to consider the longer-term implications of accumulating public debt. High levels of public debt, if not managed properly, could lead to concerns about fiscal sustainability and the government's ability to service its debt, potentially leading to uncertainties that influence consumer confidence and behavior.

Furthermore, the theory's assertion that national debt does not directly affect consumption, but rather reallocates cash from private investors, underscores the idea that public debt can have distributional effects. If public debt is used to finance productive investments that generate income and employment, it could align with the Keynesian view of stimulating consumption by increasing overall income levels. However, if the debt is not effectively utilized or if it raises concerns about fiscal stability, it could have mixed effects on consumption patterns.

Ricardian equivalence theory (1820)

The economic theory of Ricardian equivalence suggests that when a government increases its debt-financed spending to stimulate an economy, demand remains unchanged. The theory proposes that the government can finance its expenditures by creating new money, imposing taxes, or issuing bonds. If the government decides to fund its debt by raising taxes later,

taxpayers will expect that they will need to pay higher taxes in the future. Consequently, they will choose to save the extra disposable income from the initial cut instead of spending it, leading to no change in demand and output. According to Bernheim and Ricardian (1987), instead of increasing their consumption, individuals would save their disposable income to cover future taxes. In this study, the role of taxes in the impact of public debt on private consumption will be examined.

New Keynesian default theory (2020)

The "New Keynesian Default Risk Theory," introduced by Arellano, Bai, and Mihalache in 2020, merges the analysis of sovereign debt default with the established "New Keynesian" model used by central bankers. This theory primarily focuses on the intricate interplay between monetary policy and the risk of a government defaulting on its debt. By integrating default risk into the New Keynesian framework, the theory reveals that the effects of heightened default risk are more pronounced due to existing monetary frictions present in the standard model. Consequently, this leads to greater fluctuations in inflation and interest rates across economic cycles.

Relating this theory to the effects of public debt on private consumption involves understanding its broader implications. In this context, the theory suggests that elevated default risk, when embedded into the economic environment, can influence private consumption indirectly through various mechanisms. As default risk increases, it contributes to greater uncertainty within the economy. This uncertainty affects individuals' confidence in their future economic prospects, leading them to exercise caution in their spending habits. This cautious behavior arises from concerns

about potential income shocks and economic instability linked to a higher likelihood of sovereign default. Consequently, private consumption may decrease as individuals prioritize saving and reducing their exposure to potential economic risks.

Moreover, the theory points to the discipline imposed on fiscal policy and borrowing costs in the presence of heightened default risk. The increased risk associated with public debt leads investors to demand higher yields for holding government bonds from riskier countries. This elevated borrowing cost serves as a deterrent, compelling the government to exercise prudence in its borrowing and spending decisions. As a result, the government's controlled debt accumulation curtails the potential negative impacts of excessive borrowing on the overall economy. This aspect indirectly affects private consumption by influencing the macroeconomic stability and reducing the risk of economic shocks that might otherwise impact consumption patterns more severely

Permanent income theory (1850)

Milton Friedman's Income Theory of consumption is similar to the Life Cycle approach in that it posits that consumption is determined by income over the long-term rather than current income levels. Friedman refers to this long-term income projection as "permanent income" which individuals use to plan their consumption patterns. For instance, if an individual receives income only once a week, they are unlikely to consume everything on that day and nothing on the other days. Rather, they would prefer a steady consumption pattern each day. This means that consumption on a particular day is not influenced by income received on that day, but instead by the average daily

income received over a longer period. This is consistent with the life cycle hypothesis, whereby people plan their consumption based on expected average income over a long period.

This theory suggests that economic policies aimed at increasing income may not immediately lead to increased consumer spending due to workers' expectations about their future income. Unlike Keynesian economics, which suggests that people will consume based on their after-tax income at the moment, Milton Friedman believed that people base their consumption on an estimate of their future income. He argued that individuals prefer to have a consistent level of consumption rather than fluctuate based on short-term changes in income.

Relative income theory (1949)

Dusenbery interpreted Keynes' theory of consumption to suggest that a person's spending habits are not solely determined by their current income, but rather by their previous income level. Dusenbery's theory, known as the relative income hypothesis, asserts that an individual's consumption patterns are influenced by their relative position in society's income distribution, rather than their absolute income. This means that if everyone's income increases by the same percentage, their relative income will remain unchanged even though their absolute income has risen. Consequently, according to Dusenbery, the proportion of income that an individual spends on consumption will remain the same even after an increase in absolute income, resulting in an unchanged average propensity to consume (APC).

Absolute income theory (1936)

The absolute income theory posits that an individual's consumption patterns are predominantly determined by their absolute level of income, irrespective of relative income comparisons. This theory asserts that as income increases, consumption also rises due to the satisfaction gained from increased spending; however, the rate of consumption growth slows due to diminishing marginal utility. Basic needs are prioritized before discretionary spending, and gradual, stable changes in consumption occur with changes in income. While policies targeting higher absolute income levels align with this theory, critics argue that relative income and psychological factors also influence consumption choices. Nevertheless, the theory has influenced poverty alleviation and development policies by emphasizing the importance of raising absolute income to enhance individual well-being, alongside societal and cultural factors shaping consumption decisions.

The absolute income theory relates to the effects of public debt on private consumption by elucidating how alterations in individuals' absolute income levels, driven by fiscal and monetary policies tied to public debt, can shape their consumption behavior. It posits that if public debt finances government projects generating income and employment, it can elevate absolute income, potentially fostering increased private consumption. Conversely, fiscal policies like higher taxation for debt servicing might reduce disposable income and curtail consumption, echoing the theory's emphasis on income's role. Effective public debt management that stimulates economic growth and income harmonizes with the theory's notion of higher income fostering higher consumption. Additionally, public debt-induced government

borrowing and elevated interest rates align with the theory, as higher rates can elevate borrowing costs, impacting disposable income and consumption. The theory also highlights how inflation resulting from public debt can erode purchasing power, influencing consumption. Lastly, the theory's significance of economic confidence underscores that positive expectations due to prudent public debt policies can encourage consumption, while uncertainty might restrain it. In considering the effects of public debt on private consumption, the Absolute Income Theory offers insights into how fiscal and monetary policies affecting absolute income levels can mediate consumption behaviors, considering cultural, external, and policy-specific variables.

Empirical Review

Determinants of private consumption

Odionye et al. (2019) investigated the long run determinants of aggregate private consumption spending in Nigeriaover the quarterly periods of 1981 to 2016. The Auto Regressive Distributed Lag Error-correction model (ARDL-ECM) was employed to take care of short-run dynamics. In line with theories, variables included in the model were disposable income, credit facility, financial assets, government expenditure, interest rate and inflation rate. The empirical results showed that in the short run, disposable income, financial assets, interest rate and government expenditure influence private consumption spending while disposable income, financial assets, credit facilities and government expenditures are the major long run determinants of private consumption spending in Nigeria. The result equally showed that disposable income has more impact on consumption spending in the long run than it has in the short run.

Ezeji and Ajudua (2015) investigated the factors that influence aggregate consumption in Nigeria. To examine other explanatory variables and take into account consumption factors other than current income alone, the study period spanned from 1986 to 2012 using total consumption as the dependent variable, and income, interest rate, inflation rate, and currency rate as the independent variables. For the unit root test of the study, the stationarity of the employed variables was investigated using the Augmented Dickey-Fuller test. The long-term equilibrium relationship between the variables was further assessed using the Johansen Co-integration test. The results showed that consumption patterns in Nigeria may be predicted by factors such as interest rates, price levels, and currency rates. They also showed that consumption and income had a positive relationship.

Sekantsi (2016) studied the determinants o private consumption in Lesotho. The study Using the Autoregressive Distributed Lag (ARDL) model as its estmation techniqie. The study found evidence of a long-run relationship between private consumption, income, interest rates, and inflation. The empirical findings suggest that higher income is associated with higher private consumption, higher inflation reduces private consumption and that higher interest rates reduce private consumption, implying that the substitution effect outweighs the income effect in Lesotho in the long term. Although the model is not designed to evaluate consumption theories, the estimated parameters to some extent support the absolute income hypothesis (AIH), relative income hypothesis (RIH), life-cycle hypothesis (LCH) and permanent income hypothesis (PIH).

Ekong et al. (2020) also conducted a study to investigate the determinants of private consumption in Africa, using Ghana and Nigeria as case studies. Data from the World Bank database for the years 1999 to 2018 were analyzed using panel data regression, specifically the fixed effects least squares dummy variable panel regression approach. According to the analysis, private consumption was significantly and negatively impacted by savings and interest rates, while positively impacted by the gross domestic product and inflation rate. This shows that the concept of the life cycle permeates West African eating customs. The study also found that while the Keynesian position is supported by the positive and significant influence of income on consumption, the intertemporal substitution effect is supported by the negative impact of interest rates on consumption.

Bonsu and Muzindutsi (2017) analyzed the macroeconomic determinants of private consumption in Ghana using a multivariate cointegration approach. Using annual time series data from 1961 to 2013, the study employed the vector autoregressive model and Johansen cointegration technique to capture the short- and long-run interactions between a few macroeconomic variables and private consumption in Ghana. The cointegration study revealed a significant long-run relationship between real private consumption and specific macroeconomic parameters, with a marginal propensity to spend of 0.7971. According to the short-run research, private consumption has a large impact on real exchange rates and real economic growth in addition to price level changes, which have a significant impact on both. The study's findings provided insight into the macroeconomic role that private consumption plays in the economy of Ghana.

Caglayan and Astar (2012) conducted a study to determine the variables influencing private consumption in Turkey. To identify the geographical disparities in consumption habits, the study separately examined rural and urban areas. For both rural and urban areas, quantile regression was used to investigate the relationship between consumption and other factors at various locations in the distribution. Age affects consumption positively in general and in urban regions, but negatively in rural areas, according to the study. Only age, income, marital status, insurance, and household size significantly influenced consumption in rural areas. Men consumed less than women overall, according to the study's analysis, which included both urban and rural areas. These results were consistent with those from the urban areas.

Public debt and private consumption

Marmullaku et al.(2022) examined the effects of public debt on private consumption in developing europen countries. The study employed annual data spanning rom 1995 to 2020. Also, to achiev the purposes o the study,diverse methodology, which includes advanced econometric methods and techniques such as OLS, Fixed Effects, Random Effects, and GMM were used. Indings o the study showed a non-linear relationship between public debt and private consumption in developing European countries. This implies that, the increase in public debt negatively affects private consumption expenditures

Kusairi et al. (2019) studied the relationship between public debt and private consumption as well as the validity of the Ricardian equivalence hypothesis in the context of uneven financial development across 18 Asia-Pacific countries. Using dynamic heterogeneous panel data analysis on annual data from 1990 to 2017, they found that public debt and private consumption

have a long-term, co-integrated relationship and that Ricardian equivalence occurs in both the short and long run under the general technique. Private spending does not increase as public debt increases because consumers anticipate paying the debt off with more taxes in the future. When employing the standard approach, Ricardian equivalence does not hold, proving that public debt does affect private consumption. Real interest rates, inflation, government spending, capital accumulation, and income were all found to have a positive effect on private consumption.

Barben and Brosens (2015) conducted a study to investigate the non-linear effects of government debt on private consumption in OECD countries. Using the panel smooth transition regression method the researchers looked at data from 16 OECD countries. The analysis employed debt-to-GDP ratios that were extracted from the IMF's public debt database and restored by dividing them by GDP. They also used stock price data from the MSCI Global Equity indices in the Bloomberg database. Their analysis of the OECD countries revealed a nonlinear relationship between public debt and private spending. In particular, the study indicated that high levels of debt had a profoundly negative impact on private expenditure, but low levels of debt have no effect. This suggests that nations with high levels of public debt might implement fiscal policies that are less efficient in containing changes in the business cycle.

Government spending and consumption

Wisdom (2021) examined the effects of government spending on consumption using a balanced panel data of quarterly observations on 150 U.S. macroeconomic and financial time series spanning the period from

1960Q1 to 2019Q4. Using the factor-augmented vector autoregressive (FAVAR) model as the estimation technique, the study found that that government spending increases aggregate consumption; and there exists heterogeneity within durable, nondurable, and service consumption variables.

Khan et al. (2015) examined the impacts of government spending on consumption in China. The study employed the Autoregressive Distributed Lag (ARDL) approach to estimate the long and short run effects of the model using annual data from 1985 to 2013. The results of the study revealed that government spending have positive impact on private consumption. Therefore, government spending is a very good instrument to boost economy and encourage aggregate demand in China during recession.

Keho (2019) examined the impact of government spending on household consumption for the Economic Community of West African States (ECOWAS). As a modelling strategy, the study employed the Common Correlated Effect Mean Group (CCEMG) estimator that accounts for both parameter heterogeneity and cross-sectional dependence. Findings of the study indicate that indicate that government consumption has, on average, a negative effect on private consumption, implying that government and private consumption are substitutes. Country-level results reveal, however, considerable heterogeneity in the degree of substitutability across countries. They show crowding out effects in six countries, crowding in effects in one country and no significant effect in five countries. Therefore, government consumption is not a good instrument to stimulate aggregate demand and economic growth in ECOWAS countries.

Almosabbeh and Imadeddin (2020) examined the relationship between government spending and consumption in Egypt. Using time series data which span from 1970 to 2016, and employing the autoregressive distributed lag (ARDL), the study found that there is no significant relationship between government spending and private consumption in Egypt.

Inflation and consumption

Olusola et al. (2022) employed the Engle-Granger Cointegration, error correction, and granger causality as estimation techniques to determine the association between inflation rate and private consumption expenditure between 1990 and 2020. The study found that in the that there is a long-run negative significant relationship between inflation and private consumption expenditure in Ghana, meaning that private consumption expenditure in Ghana reduces on products and services during periods of high inflation than during periods of low inflation. According to the findings, inflation expectations have a detrimental impact on private consumption expenditure attitudes, particularly among consumers in a very favorable financial situation.

Obinna (2020) examined the effect of inflation on household final consumption expenditure in Nigeria for the period of 1981 to 2018 using ordinary least square econometric method. Findings of the study provide evidence that there exist a positive significant long run relationship between inflation and household consumption expenditure in Nigeria.

Effah-Nyamekye et al., (2017) examined the effects of inflation on consumer spending behaviour in Ghana during the period 1964 to 2013 using annual data. The analysis of the results was done using Ordinary least square test (OLS), the Johansen test (JH), and Vector Error Correction (VECM) test.

The findings of the studies showed stable significant long run relationship between inflation and consumer spending behaviour. Findings of the study showed a significant short run relationship between inflation and consumer spending using the VECM. The results of the OLS test show there is positive relationship between inflation and consumer spending behaviour.

Interest rate and consumption

Kapoor and Ravi (2009) estimated the change in consumption caused by a higher real interest rate in India. The study used detailed monthly consumption data from the Indian National Sample Survey to calculate regression discontinuity estimates, based on age cut-offs. The study found that an increase of 50 basis points in the interest rate on deposits leads to an immediate decline of consumption expenditure by 12%. A study of disaggregated monthly consumption expenditure reveals that the decline is primarily in non-food, non-essential items. These results therefore are useful in understanding the permanent income hypothesis within the context of an ageing world population.

Yusu et al. (2017) examined the impacts of interest rates on private consumption behavior in Nigeria between the period of 1981 and 2013 using autoregressive distributed lag (ARDL) cointegrations framework. Data or the study were sourced from the World Bank development indicators and the interest rate was augmented with other macroeconomic variables like per capita income, money supply, and banking sector credit to the private sector as regressors in determining the behavior of private consumption in Nigeria. The results confirm the existence of a relationship between private consumption

and its determinants, except real interest rate and the dummy for the impact of interest rate deregulation.

Abdelghani (2020) studied the impact of interest rate shocks as an indicator of monetary policy on household consumption and Income in Egypt during the period from 1980 to 2018. The study employed the quantitative analysis approach and used the Structural Vector Autoregressive Model (SVAR) econometric model to deduce. Findings o the study indicates that one standard deviation shock in interest rate shrinks consumption, but this very small and fast decrease is almost insignificant, while income initially increases in response to this positive shock. On the other hand, a negative shock in consumption causes a reduction in interest rate.

Taxation and consumption

Oppong (2006) examined whether there existed a significant relationship between fiscal policy variables (tax revenue and government expenditure) and private consumption expenditure in Ghana. The study relied on annual times series data spanning rom 1970 to 2006. The study found that real direct taxes had negative impact on real private consumption within the period of the study. Also, according to the findings of the study, real taxes on domestic goods and services had a positive effect on real private consumption in Ghana between 1970 and 2004.

Sen et al. (2016) analyzed the effects of tax shocks on private consumption expenditures in Turkey. The study employed the structural VAR (SVAR) model and also used a data set for the period 2003: Q1 to 2013: Q3. The empirical findings of the study show that both in the short and long run, private consumption expenditures are affected by value-added tax (VAT) and

personal income tax. The study placed emphasis that VAT plays a more important role in influencing private consumption expenditures than the other taxes under consideration. Conclusion of the study was that tax shocks on private consumption expenditures vary depending on the types of taxes, components of the private expenditures, and length of the period.

Usman (2018) used the Error Correction Mechanism to examine the effect of consumption tax on household standard of living in Nigeria. The study utilized household standard of living proxy or measured by Household Consumption Expenditure and consumption tax proxy by Value Added Tax , excise tax, and personal income tax . The result shows that value added tax, personal income tax and excise tax had negative effects on household standard of living in Nigeria. This implies that as these variables increase, the standard of living of households fall. Based on this, the study recommended that tax administrators should ensure that revenue accruing from consumption taxes such as value added tax, personal income tax and excise tax are streamlined to increase household consumption expenditure in order to induce household consumption behavior in different part of the country among others were made.

Idris and Sebastene (2023) examined the empirical relationship between indirect tax and household consumption in Nigeria using time series data covering the period of 1985 to 2020. The study employed the ordinary least square and cointegration estimation techniques for ascertain the relationship between indirect tax and household consumption. The study found a positive insignificant relationship between value added tax and household consumption. The study further revealed that personal income tax impacts

negatively, whereas inflation rate impacts negatively on household consumption. Value added tax was statistically insignificant. Inflation rate was statistically significant while personal income tax exhibited a statistically significant probability value.

Chapter Summary

This chapter reviewed some theoretical and empirical literature regarding the effects of public debt on private consumption. From the reviewed literature, growing bodies of empirical studies have demonstrated a strong relationship between public debt and other macroeconomic variables. However, as indicated by the literature reviewed, the findings on the effect of public debt on private consumption are scant. This study, therefore, fills the gap by investigating the role of fiscal and monetary policies in the effects of public debt on private consumption in Ghana.

CHAPTER THREE

RESEARCH METHODS

Introduction

The chapter gives an overview of the techniques and methods employed in the analysis of data and the estimation procedures used. It describes the sources and type of data used, the choice of variables and estimation techniques used, and the rationale.

Study Design

The research examines the role of fiscal and monetary policy on the effects of public debt on private consumption within the framework of neoclassical economics. According to the positivist, the reality is constant, stable, and open to objective observation and description without altering the events being studied (Levine,1997). Using positivist philosophy, a researcher can analyze social processes objectively and be able to explain relationships between variables. Additionally, the positivist ideology calls for the use of the quantitative research approach, which was used in this study. It is permissible for positivist philosophy to use the construction of mathematical models to investigate the relationship between quantitative measures. This study employs a quantitative method that is grounded in positivist theory.

This study employed a quantitative research design. The researcher could utilize the quantitative approach to put the social world into a structure of causality and remove the role of human influence by using a quantitative instrument like multivariate statistical analysis in the analysis of the data used in this study. More specifically, the study employed explanatory research as a

component of a quantitative method because it aimed to explain causal relationship between variables.

Theoretical Framework

To examine the role of fiscal and monetary policies in the effects of public debt on private consumption, based on the review of the theoretical and empirical literature, the study adopted the structural consumption function approach proposed by Berheim (1987). Empirical studies such as (Feldstein, 1982; Koermedi, 1983; Mariano, 1985; Blinder & Deaton, 1985) converged in estimating the structural consumption function as below;

$C_t = f(Y_t, DEF_t, GD_t, GS_t, WH_t\ SS_t, TT_t, TR_t)$…….. (1)

Where; C_t is a measure of private final consumption, Y_t, is a measure of income DEF_t measures the government deficit, GD_t is the Government debt, GS_t measures the government spending/ expenditure, WH_t measures the household wealth, SS_t is a measure of social security claims, TT_t measures total tax gains, and TR_t is the measure of government transfer to private households.

Empirical Model Specification

For the study equation (1) was augmented to take the form of equation (2) below;

$PC_t = f(\ INCT_t\ PDT_t, DRTX_t,\ INDTX_t\ , MPR_t, GEX_t INF_t\ REER_t)$……...

(2)

Where PC_t measures private consumption, INC_t measures income, PDT_t measures public debt, $DRTX_t$ measures direct tax, $INDTX$ measures indirect tax, MPR_t, measures monetary policy rate, GEX_t measures government expenditure, $INF_t\ the$ measures the inflation rate, $REER_t$ measures real

effective echange rate. To achieve the first and second objectives, equation two above was formally written as an econometric model as in equation (3) below;

Objective 1:

$$PC_t = \beta_0 + \beta_1 INC_t + \beta_2 PDT_t + \beta_3 INF_t + \beta_4 GEX_t + \beta_5 REER_t + \varepsilon_t \ldots\ldots\ldots (3)$$

Objective 2 (a):

$$PC_t = \beta_0 + \beta_1 INC_t + \beta_2 PDT + \beta_3 DRTX_t + \beta_4 INDTX_t + \beta_5 PDT_t * DRTX_{t_t} + \beta_6 PDT_t * INDTX_t + \beta_7 GEX_t + \beta_8 INF_t + \beta_9 REER_t + \varepsilon_t \ldots\ldots\ldots (4)$$

Objective 2 (b)

$$PC_t = \beta_0 + \beta_1 INC_t + \beta_2 PDT_t + \beta_3 MPR_t + \beta_4 PDT * MPR_{t_t} + \beta_5 INF_t + \beta_6 GEX_t + \beta_7 REER_t + \varepsilon_t \ldots\ldots\ldots\ldots (5)$$

Where β_0 is the constant term of the regression equation while β_1, β_2, β_3, β_4, β_5, β_6, β_7, are the coefficients that will be estimated in the equation, and ε_t is the error term.

Testing for Threshold

To identify the threshold effects of public debt on private consumption, the study used the threshold autoregression method in E views. While Phiri (2010), Frimpong and Oteng (2010), Bawa and Abdullahi (2012), and other researchers updated the model to undertake times series analysis, it was originally devised to conduct a panel study of developed and developing countries. Ankomah (2018) employed the model in a time series analysis to examine the relationship between government capital spending and

unemployment in Ghana. In testing the threshold, the observations were divided into two regimes depending on whether the threshold variable q_t was greater than or less than the threshold γ. The regimes were distinguished by differing regression slopes, β_1 and β_2 It was required that the elements of x_t were not time-invariant for the identification of β_1 and β_2 .The assumption underlying this was also that the threshold variable q_t is not time-invariant. With a mean of zero and a limited variance, the error ε_t were believed to be independent and identically distributed (iid). σ^2. The threshold model was therefore specified as;

$$y_{it} = \begin{cases} \mu_t + \beta_1' x_t + \varepsilon_t, & q_t \leq \gamma \\ \mu_t + \beta_2' x_t + \varepsilon_t, & q_t > \gamma \end{cases} \quad \text{.....(6)}$$

Definitions and Measurement of Variables

Private consumption

Private consumption expenditure was used to measure private consumption. As a percentage of GDP, private consumption is deined as the total amount of final consumption spending by residing households to cover their basic needs, including food, clothing, housing (rent), energy, transportation, durable items (particularly cars), health expenses, leisure, and other services. In other words, private consumption is the market value of all goods and services, including durable items (such as cars, washing machines, and home computers), purchased by households (World Bank, 2017). However, imputed rent for owner-occupied homes is included; purchases of homes are not included. It also includes payments and fees to governments to obtain permits and licenses. This indicator includes the expenditures of nonprofit institutions serving households even when reported separately by the country.

Private income

GDP per capita was used as a proxy for private income is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for the depreciation of fabricated assets or depletion and degradation of natural resources. For the study, this variable is expressed as a percentage of GDP and it is expected to have a positive relationship with private consumption.

Public debt

It is the overall debt stock that has a direct change in government revenues. Government debt consists of foreign and internal borrowing. Total debt service is the sum of principal repayments and interest paid in currency, goods, or services on long-term debt, interest paid on short-term debt, and repayments (repurchases and charges) to the IMF. A key variable that determines the indebtedness of a government in a given economy is its debt. It is expressed as a percentage of GDP, and it is expected to have a negative relationship with private consumption.

Direct tax

Direct tax is a tax imposed on individuals or entities (taxpayers) in respect of the income or profits earned by them (commonly called taxable income). This is generally computed as the product of a tax rate times the taxable income. Taxation rates may vary by the type or characteristics of the taxpayer and the type of income. It also includes taxes on income, profits, and capital gains levied on the actual or presumptive net income of individuals, on the profits of corporations and enterprises, and capital gains, whether realized

or not, on land, securities, and other assets. It is expressed as a percentage GDP. We expect it to have a negative relationship with private consumption.

Indirect tax

This is defined as all taxes levied on the production, extraction, sale, transfer, leasing, or delivery of goods, and the rendering of services, or on the use of goods or permission to use goods or to perform activities. They consist mainly of value-added and sales taxes. It includes general sales and turnover or value-added taxes, selective excises on goods, selective taxes on services, taxes on the use of goods or property, taxes on extraction and production of minerals, and profits of fiscal monopolies. It is also expressed as a percentage GDP. This variables is expected to have a negative relationship with private consumption.

Monetary policy rate

The monetary policy rate is an interest rate that the monetary authority (i.e. the central bank) sets to influence the evolution of the main monetary variables in the economy (e.g. consumer prices, exchange rate, or credit expansion, among others). In Ghana, since Inflation targeting is the framework under which the central bank conducts monetary policy, the monetary policy rate (MPR) serves as the primary policy tool for enforcing monetary policy and anchoring inflation expectations in the economy. It is expressed in percentages. The monetary policy rate is also a determinant of the bank interest rate that typically satisfies the private sector's short- and medium-term borrowing requirements. For this study, it is expected to have a negative relationship with private consumption.

Real effective exchange rate

The real effective exchange rate is a nominal effective exchange rate index adjusted for relative movements in the national price or cost indicators of the home country, selected countries, and the euro area. A nominal effective exchange rate index is the ratio of an index of a currency's period-average exchange rate to a weighted geometric average of exchange rates for currencies of selected countries. This variable is expected to have a negative relationship with private consumption.

Government expenditure

Government expenditure refers to the total amount of money that a government spends on various goods, services, programs, and initiatives to fulfill its responsibilities and functions. These expenses cover a wide range of activities and sectors that contribute to the functioning of a country's economy and the well-being of its citizens. Government expenditure includes spending on things like public services (education, healthcare, transportation), defense and security (military, law enforcement), social welfare programs (unemployment benefits, housing assistance), infrastructure development (roads, bridges, utilities), administrative operations (government salaries, operations), and more. It is expressed as a percentage of GDP. We expect that this variable have a positive relationship with private consumption.

Inflation rate

Inflation is defined as a percentage increase in the general prices of goods and services over some time. In other words, Inflation is a quantitative measure of the rate at which the average price level of a basket of selected goods and services in an economy increases over some time. According to Pettinger (2018), if a government borrows too much, the government may be

tempted to deal with the debt by increasing the money supply and paying off the debt through inflation. It is therfeore expected that this variable establishes a negative relationship with private consumption.

Data Type and Sources

The study relied on secondary data. Data on private consumption, income, government expenditure, inflation, and real effective exchange rate were sourced from the world development index database of the world bank whiles data on public debt, direct tax, indirect tax, and monetary policy rate were sourced from the bank of Ghana database. The study considered a sample size of 39 annual observations for the period from 1985 to 2021 for each variable. The choice of the data coverage (sample period) was informed by the fact that it was extremely challenging to get data below 1983 on some of the variables.

Estimation Procedure

To examine the relationship between public debt and private consumption, the study employed test estimations within the framework of cointegration and error-correction models. The empirical procedure involved the following steps. First of all, the study investigated the time series properties of the data by using the Zivot-Andrew and the Breakpoint unit root tests. The unit-roots test was used to check the stationarity property of the data. In the second step, it tested for cointegration using the autoregressive distributed lag (ARDL) procedure developed by (Pesaran, Shin, & Smith, 2001). Also, the stability and diagnostic test statistics of the ARDL model were examined to ensure the reliability and goodness of fit of the model.

Stationarity test

Studies involving time series analysis necessarily employ data from the past to quantify historical relationships, such that if the future happens to be like the past, then the historical relationship can be used to forecast the future. But if the future happens to be essentially different from the past, then those historical relationships may not be reliable in forecasting the future. Hence it is fundamental that time series variables follow at least a stochastic process and are stationary. As part of the study, it employed the Zivot-Andrew and the Breakpoint unit root test to determine the stationary of the variables.

Unit roots test

To ensure that each of the variables used in the model is stationary, there was the need to run a series of tests called the unit root test. A time series is stationary if its mean, variance, and auto-covariances are independent of time. However, due to the data generation process, time series data are rarely stationary. A spurious regression is likely to be encountered when non-stationary data is used in the regression. Spurious regression occurs when the regression results reveal a highly significant relationship among variables that in reality might be false or inconsistent with theory (Enders 2015). In addition, stock and Waston 1988 noted that the usual test statistics (t, F, DW, and R^2) will not possess standard distributions if some of the variables in the model have unit roots. To avoid the estimated coefficients being spurious the study employed the Zivot Andrew and the Breakpoint unit root tests.

The Zivot Andrew and Breakpoint unit root tests were employed to ensure reliable results of the test for stationarity due to inherent weakness in each method/ technique. The motive for applying these tests rather than the

traditional Augmented Dickey-Fuller (ADF) and the Philip Perron (PP) tests for unit root was that they have the power to tackle the problem of structural breaks in the series which the two traditional unit root tests of ADF and PP do not have. Zivot and Andrews (1992) modified the PP and ADF unit root test, which also considers the one-unknown structural break.

Choice of Estimation Technique

To achieve the objectives, the study adopted the bounds-testing approach to co-integration in the ARDL framework. ARDL can be applied if variables have mixed order of integration, that is I(0) and I(1). This approach takes the optimum lag length for each variable separately in the model which helps in the data-generating process from a general to a specific model. The problems resulting from the non-stationarity of data can also be avoided by using an ARDL approach (Laurenceson & Chai, 2003).

Autoregressive distributed lag (ARDL) approach to cointegration

The relationship between public debt and private consumption could be investigated through the use of different methods. The following methods have been used widely in similar analyses: Engle and Granger (1987) test, fully modified OLS procedure (FMOLS) of Phillips and Hansen (1990), maximum likelihood-based Johansen (1991) and Johansen-Juselius (1990) tests. However, all the above-mentioned methods are weak since they do not provide robust results and render inefficient results. It was as a result of these problems that the Autoregressive Distributed lag model is preferred. Some of the co-integration procedures above such as the Engel and Granger (1987) procedure have been criticized for the inability to test a hypothesis concerning the estimated coefficients in the long-run relationships and small sample bias

as a result of the exclusion of the short-run dynamics. Even though Phillips and Hansen's (1990) method deals with these shortfalls, their procedure also requires all the variables in the model to be integrated of order one that is I(1). However, the use of the Autoregressive Distributed Lag (ARDL) model has many advantages over several other models.

Firstly, the ARDL cointegration procedure is relatively more efficient in small sample data sizes as is the case in this study. This study covered the period 1983–2021. Thus, the total observation for the study was relatively small.

Another key advantage is that it is significant whether a series is integrated of order one, I(1), or of order zero, I(0), or even mutually cointegrated. It also produces more robust results. This model has a consistent long-run coefficient as well. It is advantageous in the sense that it provides both long-run and short-run relationships. Moreover, a dynamic error correction model (ECM) is derived from the ARDL for the integration of short-run dynamics with the long-run equilibrium. Due to these advantages possessed by the ARDL, it was used in the analysis of this work and this was due to the advantages it possesses over other models.

The ARDL model, unlike the Johansen Cointegration method, avoids the problem with a large number of dependent and independent variables to be included. Endogeneity is not a problem in the ARDL model as long as this model is free of residual correlation. Serial correlation and endogeneity problems are corrected with the appropriate lags in the ARDL model. It is also able to differentiate between endogenous and exogenous variables even if the

explanatory values are exogenous. (Pesaran & Pesaran, 1999; Pesaran et al., 2001).

The ARDL approach adopts the Ordinary Least Square (OLS) to test for the long-run relationship among the variables by carrying out an F-test for the joint significance of the coefficient of the lagged variable in the model. That is by regressing a variable on others in the model. For example, private consumption was taken as the dependent variable and regressed on the independent variables and afterward, income, which was an independent variable, was regressed on the other independent variables. This was repeated for all the variables and after running all these regressions, it was observed that the total number of regressions ran was equal to the number of variables used in the model.

The study relied on the combination of I (0) and I (1) variables hence the appropriate procedure was the ARDL procedure. Following Pesaran et al.(2001) as summarized in Choong et al. (2005), this study applied the bounds test procedure by modeling the long-run equation as the general autoregressive (AR) model of order p, in Z_t:

$$Z_t = \alpha_0 + \beta_t + \sum_{i=1}^{p} \emptyset_i \, Y_{t-1} + \varepsilon_t \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

$$t = 1, 2, \ldots, T$$

With α_0 representing (k + 1) – a vector of intercept (drift), and β_t denoting (k + 1) – a vector of trend coefficients.

Cointegration test

The cointegration analysis allows us to check for the long-run relationship among the variables included in the model. The series are co-integrated if they exhibit a well-established long-run relationship or a common trend. That is if we consider two times series, X and Y that are non-stationary,

we will expect that a linear combination of the two variables would also be non-stationary. To avoid the problem of non-stationary, it was necessary to make use of the first differenced data. Several methods are available for conducting the cointegration test. The most commonly used methods include the residual-based Engle-Granger (1987) test, Johansen-Juselius (1990) test, and the maximum likelihood-based Johansen (1995). This remained the technique of choice for many researchers who asserted that this is the most accurate method to apply for series integrated of order one (that is I (1)) and generally requires larger observation variables. However, the number of observations employed in the study did not permit the researcher to use the Johansen-Juselius test. The study employed the bounds test procedure to test for the presence of a long-run relationship among the variables.

Bounds testing procedure

This bound testing approach has some econometric merits over other cointegration methods. The bounds test is applicable irrespective of whether variables are either I (1), purely I (0), or fractionally integrated meaning it does not require pre-testing of the series to determine their order of integration. Also, it is applicable in small samples. The ARDL bounds testing approach is to estimate equation (2) by ordinary least squares (OLS) to test for the existence of a long-run relationship among the variables by conducting an F-test for the joint significance of the coefficients of the lagged levels of the variables. This was done by restricting the coefficients of the lag values to zero. That is specified as:

$H_0 = \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$…….. (8)

$H_1 = \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq 0$…… (9)

Two asymptotic critical value bounds provide a cointegration test when the independent variables are I(d) (where 0≤d≤1): a lower value assuming the regressors are I(0), and an upper value assuming purely I(1) regressors. The null hypothesis of no long-run relationship can be rejected irrespective of the orders of integration for the time series if the F-statistic is above the upper critical value. Conversely, if the F-statistic falls below the lower critical value the null hypothesis cannot be rejected. Finally, if the statistic falls between the lower and upper critical values, the result is inconclusive and depends on whether the underlying variables are I(0) or I(1). This necessitates the testing for unit roots on the variable under investigation (Pesaran & Pesaran, 1997). The approximate critical values for the F-test can be obtained from Pesaran and Pesaran (1997, p.478). However, given that Pesaran's critical values are based on simulated large sample size, this study will use the critical values developed by Narayan (2004) since it is more appropriate for small samples.

Once the existence of a long-run relationship among the variables in the model is established, the ARDL methodology estimates the number $(m + 1)^{k+1}$ of the regressors where m the maximum number of lags and k is the number of the variable in the equation (Pesaran & Pesaran, 1997). The orders of lags of the ARDL models are selected using, either, Schwartz-Bayesian Criteria, Akaike's Information Criteria, the R^2 criteria or the Hannan and Quinn criteria. The SBC uses the smallest possible lag length and is considered as most parsimonious model whereas the AIC chooses the maximum necessary lag length (Shrestha & Chowdhury, 2005).

In the next stage of the ARDL bounds approach, once cointegration is established the conditional long-run model of an expression of the relationship between public debt and private consumption was expressed in an ARDL model as below;

$$\Delta PC_t = \psi_0 + \emptyset PC_{t-1} + \alpha_1 INC_{t-1} + \alpha_2 PDT_{t-1} + \alpha_3 \mathrm{INF}_{t-1} + \alpha_4 \mathrm{GEX}_{t-1} + \alpha_5 REER_{t-1} + \sum_{i=1}^{\kappa} \beta_2 \Delta INC_{t-1} + \sum_{i=1}^{\kappa} \beta_3 \Delta PDT_{t-1} + \sum_{i=1}^{\kappa} \beta_4 \Delta INF_{t-1} + \sum_{i=1}^{\kappa} \beta_5 \Delta GEX_{t-1} + \sum_{i=1}^{\kappa} \beta_6 \Delta REER_{t-1} + \varepsilon_t \quad \ldots\ldots\ldots(10)$$

This was followed by the estimation of the short-run parameters of the variables with the error correction representation of the ARDL model. The speed of adjustment was determined by the application of the error correction model. The unrestricted ARDL error correction representation was estimated when there exists a long-run relationship as:

$$\Delta PC_t = \psi_0 + \sum_{i=1}^{\kappa} \beta_1 \Delta PC_{t-1} + \sum_{i=1}^{\kappa} \beta_2 \Delta INC_{t-1} + \sum_{i=1}^{\kappa} \beta_3 \Delta PDT_{t-1} + \sum_{i=1}^{\kappa} \beta_4 \Delta \mathrm{INF}_{t-1} + \sum_{i=1}^{\kappa} \beta_5 \Delta \mathrm{GEX}_{t-1} + \sum_{i=1}^{\kappa} \beta_6 \Delta \mathrm{REER}_{t-1} + \gamma ECT_{t-1} + v_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots(11)$$

Where the short-run dynamics are the coefficients, while γ is the speed of adjustment to long-run equilibrium following a shock to the system and ECT_{t-1} is the error-correction term, the residuals from the cointegration equation lagged one period are given by:

$$ECT_t = PC_t - \psi_0 - \sum_{i=1}^{\kappa} \beta_1 PC_{t-1} - \sum_{i=1}^{\kappa} \beta_2 \Delta INC_{t-1} - \sum_{i=1}^{\kappa} \beta_3 \Delta PDT_{t-1} - \sum_{i=1}^{\kappa} \beta_4 \Delta INF_{t-1} - \sum_{i=1}^{\kappa} \beta_5 \Delta GEX_{t-1} - \sum_{i=1}^{\kappa} \beta_6 \Delta REER_{t-1} \ldots\ldots\ldots (12)$$

Once the variables are co-integrated, their dynamic relationship can be specified by an error correction representation as argued by Engle and Granger (1987) in which an error correction term (ECT) computed from the long-run equation must be incorporated to capture both the short-run and long-run

relationships. The error correction term indicates the speed of adjustment to long-run equilibrium in the dynamic model. In other words, the magnitude of the ECT shows how quickly the variables converge to equilibrium when they are disturbed. The ECT is expected to be statistically significant with a negative sign. The negative sign indicates that any shock that occurs in the short run will be corrected in the long run. The larger the coefficients of the error correction term in absolute terms, the faster the convergence to equilibrium.

To ascertain the appropriateness of the ARDL model, diagnostic and stability tests were conducted. The diagnostic test examined the serial correlation, functional form, and heteroskedasticity associated with the selected model. It was important to conduct a stability test as opined by Pesaran and Pesaran (1997) suggested we employed the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) to test the stability of the parameters. The CUSUM and CUSUMSQ statistics are updated recursively and plotted against the breakpoints. Tables were used in the descriptive analysis. Unit root tests were conducted on all the variables to verify their order of integration. Also, the study adopted the ARDL econometric methodology for co-integration to obtain both the short-run and long-run estimates of the main variables involved in the study and the threshold autoregressive method was also employed to estimate the threshold effects of the fiscal and monetary policy channels through which public debt affect private consumption. All estimations were conducted using Econometric views (E-views 12).

Chapter Summary

This chapter formulated the econometric model to be estimated for the study and specified the technique to be used for estimation. The methodology of the study was developed from the structural consumption function approach proposed by Bernheim (1987) in which private consumption was labeled as a function of public debt, private income, direct tax, indirect taxes, monetary policy rate, inflation rate, government expenditure, and real effective exchange rate. Furthermore, the study described the sources, data, and variables used in the study and their expected signs. The ARDL approach to cointegration and error correction models were used to find out the adjustment to equilibrium in case there was disequilibrium in the model. Finally, the thereshold autoregressive method was employed to determine the optimal level of public debt on private consumption.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

Introduction

This chapter discusses the findings of the study, which includes a presentation and analysis of the descriptive statistics of the relevant variables. Furthermore, it examines the results and implications of various tests such as the Breakpoint and Zivot-Andrew unit root tests, the bounds test approach to cointegration with both the long-term and short-term dynamics and the threshold effects of public debt on private consumption.

Descriptive Statistics

In this section, an analysis of the descriptive statistics is carried out. The descriptive statistics are presented in Table 1.

Table 1:Summary Statistics

	PCS	INC	PDT	DRTX	INDTX	MPR	GEX	INF	REER
Mean	81.552	5.006	75.639	4.501	3.747	23.17	14.566	23.449	197.600
Med	83.192	4.821	65.442	4.398	3.883	20.50	13.851	17.149	103.571
max	94.232	7.701	181.643	7.351	5.937	45.0	28.337	122.88	3053.736
Min	70.112	3.052	26.215	0.978	0.813	12.50	3.635	4.865	68.184
St. Dv	6.551	1.410	36.213	1.632	1.513	9.11	5.842	20.803	475.732
Skew	-0.079	0.329	0.871	-0.072	-0.481	1.0273	0.166	3.024	5.7670
Kurt	2.247	1.889	3.203	2.234	2.148	3.290	2.465	14.518	35.094
Jarque	0.962	2.711	5.001	0.987	2.682	6.9585	0.645	274.99	1889.989
Prob	0.618	0.258	0.082	0.610	0.262	0.0308	0.724	0.0000	0.00000
Sum	3180.530	0.000195	2949.919	175.551	146.119	903.50	568.079	914.495	7706.343
Sm Sq	1630.545	7.521	49831.56	101.231	87.001	3152.7	1298.325	16445.21	8600209.
obs	39	39	39	39	39	39	39	39	39

Note: Std. Dev. represents Standard Deviation while Sm Sq. Dev. Represents the Sum of the Squared Deviation
Source: Author (2022)

Table 1 displays the mean and median values of various series, with the first two rows showing the average and middle values. Across the study period, private consumption represented 81.55% of GDP, income 5.00% of GDP, and public debt, direct tax, indirect tax, and monetary policy averaged 75.64%, 4.50%, 3.75%, and 23.17%, respectively. The median values of these variables (PCS, INC, PDT, DRTX, INDTX, MPR) were approximately 83.19%, 4.82%, 65.44%, 4.40%, 3.88%, and 20.50% respectively. Comparing the means and medians indicates that these variables exhibit minor symmetry since their values are close to each other.

Each series in Table 1 is accompanied by its respective maximum and minimum values, which are displayed under the headings "maximum" and "minimum," respectively. The findings in Table 1 reveal that the highest private consumption as a percentage of GDP is approximately 94.23%, with a minimum value of 70.11% of the country's GDP. The highest level of private income recorded is also about 7.70% of gross domestic product, while the lowest income level during the study period is around 3.05%. Public debt, expressed as a percentage of GDP, has a maximum value of 181.64 and a minimum of 26.22. Regarding fiscal and monetary policies, direct tax as a percentage of GDP, indirect tax as a percentage of GDP, and the monetary policy rate have maximum values of 7.35, 5.94, and 45.00, respectively, with corresponding minimum values of 0.97, 0.81, and 12.50.

The measure of dispersion around the mean in the series is calculated as the standard deviation. Standard deviation is difficult to interpret in absolute terms. However, it can be interpreted in relative terms by comparing the standard deviation for two different distributions, i.e., the distribution with a

smaller standard deviation exhibits less dispersion and the larger standard deviation shows higher dispersion. Accordingly, in Table 1, private income as a percentage of GDP is a relatively less dispersed series with a standard deviation of 1.41, while the whiles inflation rate is a relatively highly dispersed series with a standard deviation value of 20.80. The larger the dispersion between the values, the higher the standard deviation that shows greater volatility in the variable. This implies that relatively, the inflation rate is a more volatile variable.

Skewness is a statistical measure that determines how symmetrical the distribution of a dataset is about its mean. A perfectly symmetrical distribution has a skewness value of zero. In Table 1, many of the variables have skewness values that are close to zero, indicating that they are nearly symmetrical distributions. However, there are a few exceptions to this pattern, including the monetary policy rate and inflation rate. Moreover, private consumption, direct tax, and indirect tax are negatively skewed, meaning that they exhibit a long tail on the left side of the distribution. This implies that the majority of the observations in these variables are greater than their mean value.

Simply observing the values of skewness and kurtosis is not a reliable method to determine whether a dataset is normally distributed or not. Instead, Table 1 provides the results of the Jarque-Bera (JB) test for normality for each variable, assuming a normal distribution. The probability values given in Table 1 indicate that the null hypothesis of the normal distribution cannot be rejected for all the key variables as they have probability values greater than 5%. It is worth mentioning that the study was based on 39 observations.

Unit Root Test Results

The results of Break-Point and Zivot-Andrew unit root tests with constant and trend in the model for all the variables are presented in Table 2. The study employed the Break-Point and Zivot-Andrew unit root tests to take care of the presence of structural breaks in some of the variables. The study uses the P-values as captured in Table 2 to make the unit root decision, (that is, rejection or acceptance of the null hypothesis that the series contain unit root) which arrived at a similar conclusion with the critical values.

Table 2: Results of Breakpoint and Zivot Andrew Unit Root Tests

	Zivot Andrew unit root test		**Breakpoint unit root test**	
Variables	At levels	First difference	At levels	First difference
PCS	-4.609534***	-5.056332***	-4.656909	-7.310619***
INC	-4.887387	-5.666159***	-5.095700	-8.006059***
PDT	-3.858166***	-4.429654***	-4.209367	-8.695646***
DRTX	-4.494041***	-4.403230***	-4.476588	-9.989776***
INDTX	-4.042279**	-8.388488***	-4.356726	-9.328637***
MPR	-4.881600***	-7.467947**	-7.414881***	-11.72691***
GEX	-4.241509	-5.292721**	-6.052855***	-7.496992***
REER	-12.72517*	-6.312776*	-78.88969***	-167.8974***
INF	-7.071510*	-6.421783**	-7.579800***	-7.044743***

Note. ***, ** and * indicate significance level at 1%, 5% and 10% respectively.
Source: Author (2022)

According to the results of the unit root test presented in Table 2, the null hypothesis that income, government expenditure, and contain a unit root cannot be rejected, as the P-values of the Zivot Andrew statistics are not statistically significant at any of the three conventional levels of significance. However, for private consumption, public debt, direct taxes, and monetary policy rate, the unit root hypothesis is statistically significant at the 1% level.

While the inflation rate and indirect tax exhibit statistically significant unit roots at the 5%, real effective exchange rate exhibits a statistically significant root and 10% level. However, when the first difference is taken, all variables become stationary. This is because the null hypothesis of the presence of unit roots is rejected at the 5% level of significance for all the estimates.

Table 2 also provides the results of the breakpoint unit root test for the presence of a unit root with intercept and trend in the model for all variables. Based on the results in Table 2, the null hypothesis of the presence of unit root for most of the variables in their levels cannot be rejected, as the P-values of the breakpoint statistics are not statistically significant at any of the three conventional levels of significance, except for monetary policy rate, government expenditure, real effective exchange rate, and inflation which were significant at the 1% level. However, when the first difference is taken, all variables become stationary at a 1% level of significance. This is because the null hypothesis of the presence of a unit root is rejected at a 5% level of significance for all the estimates. The results of the breakpoint unit root test in Table 2 are consistent with those of the Zivot Andrew test, indicating that most variables are integrated of order one, I(1), with intercept and trend in the model.

The unit root test results reveal that the variables can be categorized as integrated of order zero, I(0), or order one, I(1), but none of them are integrated of order two, I(2). Therefore, the ARDL methodology is employed for estimation.

Effects of Public Debt on Private Consumption

To achieve the first objective of the study, the researcher performs the long-run and short-run analyses below to determine the relationship between public debt and private consumption.

Test for cointegration

Given that some of the variables are integrated of order one while others are integrated of order zero, it's crucial to check if there is a long-term equilibrium relationship between these variables using the bounds testing method for cointegration. Since annual data is used, a lag length of 2 is used for the bounds test, as recommended by Pesaran et al. (1999) for annual data. Once the lag length is determined, an F-test is performed to check the joint significance of the coefficients of the lagged levels of the variables. This F-test is important in determining whether there is cointegration among the variables in the long run. Table 3 shows the results of the F-statistics computed when private consumption is normalized as the dependent variable in the ARDL-OLS regression.

Table 3: Bound test for Cointegration

F-Bound Test		**Null Hypothesis: No Levels Relationship**		
Test Statistics	Value	Significance	I (0)	I (1)
		Asymptotic: n=1000		
F- statistics	6.645670	10%	2.75	3.79
K	5	5%	3.12	4.25
		2.5%	3.49	4.67
		1%	3.93	5.23
Actual Sample Size	36	Finite Sample Size: n=40		
		10%	3.032	4.213
		5%	3.577	4.923
		1%	4.885	6.55
		Finite sample size: n= 35		
		10%	3.087	4.277
		5%	3.673	5.002
		1%	5.095	6.77

Note: k is the number of regressors used in the model.
Source: Author (2022)

Table 3 presents the results that indicate a stable and lasting relationship exists among the variables used in the equation. The F-statistics value of 6.645670 is higher than the upper bound critical value of 4.25 at a 5% significance level. As a result, the null hypothesis, which assumes no cointegration, is rejected, implying that there is a stable long-run equilibrium relationship (cointegration) among the variables in the equation. This suggests that there is a long-term association among the variables used in the model. The estimated coefficients for the long-term and short-term impacts of public debt, private income, government expenditure, inflation, and the real effective exchange rate are discussed below.

Results of the long-run relationship between public debt and private consumption

Given the results of the cointegration analysis, the long-run relationships among the variables are estimated using the ARDL framework and the results are presented in Table 4. The Akaike Information Criteria (AIC) and a lag length of two (2) as selected by the AIC are used in the estimation of the ARDL model. As shown in Table 4, the result of the long-run estimates that all the variables exert an insignificant effect on private consumption in the long run except income and public debt which are significant at 10% and 5% levels of significance respectively.

Table 4: Long Run Estimated Based on ARDL Approach

Variable	Coefficient	Std error	t- Statistics
INC	7.2808*	4.1208	1.766332
PDT	-0.419390**	0.199261	-2.104733
INF	8.094917	5.811064	1.393018
GEX	-28.73132	19.31937	-1.487177
REER	-0.137748	0.125445	-1.098068

Note. ***, ** and * indicate significance level at 1%, 5% and 10% respectively.
Source: Author (2022)

From Table 4, the long-run relationship results show that public debt has a negative significant relationship with private consumption since the coefficient of public debt, in the long run, is negative at a 5% level of significance. To put it differently, if the public debt level increases by 1% in the long term, private consumption will decrease by approximately 0.42%, as suggested by the coefficient of -0.419. This reduction in private consumption could be a result of people's expectation that the government will raise taxes to pay off the debt. As a result, people tend to save more and spend less to prepare for future tax obligations, which may negatively cause a reduction in their consumption level. This result is in line with the findings of Cho and Rhee's (2013) research, which indicated that public debt decreases private consumption over time.

Also, based on Table 4, the results indicate that private income has a positive positive relationship with private consumption at a significant level of 10% in the long run. Specifically, a percentage increase in private income (GDP per capita) as a percentage of GDP, leads to an approximately 7.28% increase in private consumption. This implies that an increase in GDP per capita (private income) results in a rise in the average level of private consumption. In line with Keho (2016), income growth has been effective in increasing the average level of private consumption, although it has not resulted in poverty reduction in the West African Economic and Monetary Union member countries.

However, the results in Table 4 show that the control variables (government expenditure, inflation, and real effective exchange rates) do not have a significant relationship with private consumption in the long run. The

Error Correction Model (ECM), which calculates the speed of adjustment to the long-run equilibrium when there is any disequilibrium in the system in the short run as a result of shocks, is presented as follows:

EC= PCS – (728359179.7568*DINC – 0.4194*DPDT + 8.0949DINF - 28.7313*DGEX -0.1377*DREER)……. (10)

Results of the short-run relationship between public debt and private consumption

Table 5:Estimated Short run ECM using the ARDL

Variable	Coefficient	Std. Error	T- Statistics
C	79.43642***	10.50754	7.559942
@TREND	-1.768650***	0.254514	-6.949113
D(PCS(-1))	-0.522918***	0.082109	-6.368566
D(INC)	3.5408***	1.76E+08	0.000000
D(INC(-1))	-2.6208***	98040817	0.000000
D(PDT)	-0.059244*	0.031133	-1.902914
D(PDT(-1))	0.104868**	0.031485	3.330683
D(INF)	2.257401**	0.813517	2.774865
D(INF(-1))	-3.403382***	0.669280	-5.085142
D(GEX)	3.314068	3.172597	1.044592
D(GEX(-1))	24.31733***	4.500056	5.403783
D(REER)	0.018420	0.036555	0.503903
ECM(-1)*	-0.753789***	0.105603	-7.137937

Note. ***, ** and * indicate significance level at 1%, 5% and 10% respectively.
Source: Author (2022).

After establishing the long-term relationship among variables using the ARDL framework, the study proceeds to estimate their short-term relationships. Engle and Granger (1987) suggest that if the variables are cointegrated, their dynamic relationship can be represented by an error correction term (ECT) which is derived from the long-term equation. This ECT term captures both short-term and long-term relationships and shows the

speed at which the variables adjust to restore equilibrium in the dynamic model. It is expected to have a statistically significant negative coefficient, indicating how quickly the variables return to equilibrium following a shock. If the error correction term is highly significant, it confirms the existence of a long-term relationship among the variables, as noted by Banerjee, Dolado, and Mestre (1998).

The results in table 5 indicate that the lagged error correction term coefficient (ECTt-1) is negative and extremely significant at a 1% level, providing evidence of the co-integration relationship between the variables. ECT represents the rate at which the dynamic model adjusts to restore equilibrium after a disturbance. The absolute value of the error correction term coefficient is 0.75, indicating that approximately 0.75% of the deviation from the long-term private consumption rate is corrected each year, moving from the short run to the long run. This suggests that around 0.75% of the previous year's disequilibrium is resolved in the current year due to the highly significant error correction term. The general principle is that a higher absolute value of the error correction coefficient indicates a quicker equilibration of the variable in the long run after a shock. Therefore, the outcome shows that the adjustment speed in the model is relatively high.

The results from Table 5 show that in the short run, public debt has a negative statistically significant relationship with private consumption. The results show that, in the short run, a percentage increase in public debt leads to an approximately 0.056% reduction in private consumption. Moreover, the results revealed that the previous year’s level of public debt significantly causes an increase in the current year’s private consumption. This relation is

significant at a 1% level of significance. This result indicates that a percentage increase in last year's debt stock increases private consumption by 0.10 % this year. The reason may be that last year's borrowings by the government were invested into employment creation that would affect the aggregate output to increase household income and private consumption. This is in line with the findings of Kusari et al. (2019).

Additionally, the results presented in table 5 reveal a significant positive relationship between income and private consumption. The findings indicate that in the short run, a 1% rise in consumers' income level leads to a 3.54% increase in their consumption level in the Short run, with a significance level of 1%. These results are consistent with the findings of Ekon et al. (2020), which confirm that income is indeed a significant determinant of consumption.

Furthermore, the findings displayed in table 5 demonstrate that inflation has a positive relationship with private consumption. The results reveal that a 1% increase in the inflation rate leads to an approximately 2.26% rise in private consumption in the short term, as validated at a significant level of 1%. This is because, during times of inflation, individuals have to spend more money on a limited number of goods and services to sustain their livelihoods. These outcomes are consistent with the conclusions of Obinna (2020) and Carneiro (2010), who also discovered a positive relationship between inflation and private consumption in Nigeria's economy. However, the results displayed in table 5 also indicate that the previous year's inflation rate reduces the current year's consumption by 3.40% in the short term, which is statistically significant at the 1% level. These findings correspond with the

discoveries of Olusola et al. (2022), which confirmed a negative relationship between inflation and private consumption in Ghana.

In addition, as displayed in table 5, exhibits a positive insignificant relationship between government expenditure and private consumption. Notwithstanding, the results show that the previous year's government expenditure has a positive relationship with current years' private consumption at a 1% significant level. This implies that a percentage increase in last year's government expenditure increases the current year's consumption by 24.32%. This is also possible if last year's government expenditure was on employment creation. This is also consistent with the findings of Barbens and Brobens (2015) which state that private consumption and government spending are complementary where the increase in government spending has the potential to improve marginal private consumption.

Furthermore, the results in table 5 show that the real effective exchange rate has no significant relationship with private consumption.

Table 6:Goodness of Fit of the Model

R- squared	0.975551	Mean dependent var	0.126862
Adjusted R-Squared	0.949663	S.D. dependent var	6.426582
S.E of regression	1.441859	Akaike info criterion	4.7101739
Sum Squared Resid	35.34225	Schwarz criterion	4.166691
Log Likelihood	-50.74987	Hannan-Quinn criteria.	4.608757
F-statistic	37.68428	Durbin-Watson stat	2.015599
Prob(F-statistic)	0.000000		

Source: Author (2022)

The regression as a whole is significant at the 1% level, as evidenced by the F-statistics probability value in Table 6. Furthermore, the table shows that the data used in the study is robust, with an adjusted R-squared of over

50% (approximately 98%), indicating a satisfactory statistical fit of the regression model to the data. The joint significance of the independent variables in the model is suggested by an F-statistic value of 37.68. The model does not suffer from first-order serial correlation, as indicated by the Durbin-Watson result of approximately 2.0, implying the absence of autocorrelation. Additionally, the model's fitness was tested in four main ways, as detailed in Appendix A.

Fiscal Policy Channels Through which Public Debt Affects Private Consumption

To accomplish the study's second objective, the researcher first analyses both the long and short term to investigate the fiscal policy channels by which public debt influences private consumption.

Test for cointegration

This session of the study seeks to examine the fiscal policy channels through which public debt affects private consumption. To achieve this, it is important to test for the existence of a long-run equilibrium relationship between these variables within the framework of the bounds-testing approach to cointegration. The F-test is used to determine the existence or otherwise of cointegration among the variables in the long run. The results of the computed F-statistics when private consumption is normalized (that is, considered as a dependent variable) in the ARDL-OLS regression are presented in Table 7.

Table 7: Bound test for Cointegration

F-Bounds Test		**Null Hypothesis: No levels of Relationship**		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.622433	10%	2.16	3.24
K	9	5%	2.43	3.56
		2.5%	2.67	3.87
		1%	2.97	4.24
Actual Sample Size	36		Finite Sample: n=40	
		10%	-1	-1
		5%	-1	-1
		1%	-1	-1
			Finite Sample: n=35	
		10%	-1	-1
		5%	-1	-1
		1%	-1	-1

Note: k is the number of regressors used in the model.
Source: Author (2022)

Table 7 indicates the presence of a consistent long-term relationship between the variables involved in the equation. The F-statistics value of 4.622433 is higher than the upper bound critical value of 3.56 at the 5%level of significance. Hence, the null hypothesis of no cointegration is rejected, demonstrating that there is a stable long-term equilibrium connection among the variables (cointegration) included in the equation. This implies that there is a long-term relationship between the variables in the estimated model. The estimated coefficients for the long and short-term fiscal policy channels through which public debt affects private consumption are presented below;

Long run results of the fiscal policy channels through which public debt affects private consumption

Table 8:Long Run Estimated Based on ARDL Approach

Variable	Coefficient	Std. Error	t-Statistic
PDT	-0.211647	0.230444	-0.918433
INC	7.81E08	6.26E+08	1.247045
DRTX	0.527509	1.567569	0.336514
INDTX	-1.572607	1.570754	-1.001180
PDT*RDTX	-3.764666	39.15858	-0.961390
PDT*INDTX	-0.097547	0.097155	-1.004032
GEX	-22.18423	26.70465	-0.830725
INF	5.527504	5.568545	0.992630
REER	-0.179435	0.185094	-0.969428

Note. ***, ** and * indicate significance level at 1%, 5% and 10% respectively.
Source: Author (2022).

Table 8 presents the long-run results on the fiscal policy channels through which public debt affects private consumption. By so doing, the researcher discusses the role direct tax and indirect taxes play in the effect of public debt on private consumption. The results show that all variables have an insignificant relationship with private consumption in the long run. However, whiles public debt and indirect taxes exhibit a negative relationship with private consumption, income, and direct taxes exhibit a positive relationship. The table also reveals that, in the long run, there is a negative joint effect of public debt and taxes (direct and indirect taxes) on private consumption.

The Error Correction Model (ECM), which calculates the speed of adjustment to the long-run equilibrium when there is any disequilibrium in the system in the short run as a result of shocks, is presented as follows:

EC =D PCS - (-0.2116*DPDT + 780795474.3214*DINC + 0.5275*DDRTX -1.5726*DINDTX -37.6467*PBT#DRTX -0.0975*PBT#INDTX - 22.1842*DGEX + 5.5275*DINF -0.1794*DREER)

Shortrun results of the fiscal policy channels through which public debt affects private consumption

Table 9: Short Run Estimated Based on ARDL Model

Variable	Coefficient	Std. Error	T-Statistic
C	146.6741***	13.75638	10.66226
@TREND	-2.403899***	0.228420	-10.52403
D(PCS(-1))	-0.469387***	0.060176	-7.800232
D(PDT)	-0.094141**	0.034136	-2.757775
D(PDT(-1))	-0.119658**	0.045989	-2.601913
D(INC)	5.7208***	1.29E+08	0.000000
D(INC(-1))	-4.3308***	72850663	0.000000
D(DRTX)	2.901385**	0.993910	2.919163
D(DRTX(-1))	-2.962106**	1.085768	-2.728120
D(INDTX)	-0.007963	0.255135	-0.031211
D(INDTX(-1))	0.989048**	0.345028	2.866573
D(PDT#DRTX)	-9.655583**	3.949828	-2.444558
D(PDT#DRTX (-1))	37.16489***	8.966208	4.144995
D(PDT#INDTX)	-0.030745*	0.014109	-2.179163
D(PDT#INDTX (-1))	0.043507**	0.014933	2.913483
D(GEX)	6.584044**	2.351283	2.800192
D(GEX(-1))	25.67536***	2.927383	8.770756
D(INF)	3.696605***	0.644789	5.733046
D(DINF(-1))	-3.163674***	0.459045	-6.891862
D(DREER)	0.019604	0.026683	0.734688
ECM(-1)*	-0.959490***	0.092604	-10.74992

Note. ***, ** and * indicate significance level at 1%, 5% and 10% respectively.
Source: Author (2022).

Table 9 displays the short-term results of the fiscal policy channels through which public debt affects private consumption. The results show that, in the short run, public debt has a negative significant relationship with private consumption. This is depicted by the coefficient -0.094141 at a 5% level of significance. The implication is that, in the short run, a percentage increase in

public debt leads to an approximately 0.094 decrease in private consumption. The result also shows that, in the short run, a percentage increase in private income increases private consumption by approximately 5.72% at a 1% level of significance.

Also, table 9 reveals that, in the short run, an increase in direct tax increases private consumption. Thus, a percentage increase in direct taxes increases the level of private consumption by approximately 2.90 at a 5% level of significance. Intuitively, this may be because direct taxes deter consumers from consuming luxurious goods but normal goods and necessities. This also confirms the findings of Bahloul and Ghorbel (2019) who found that higher direct tax (income tax) has a positive effect on private consumption, especially for lower-income households. On the other hand, the results in table 9 depict a negative insignificant relationship between indirect tax and private consumption in the short run.

The study proceeds to analyze the fiscal policy channels in the effects of public debt on private consumption in the short run. Table 9 shows that, in the short run, public debt and direct taxes jointly reduce private consumption. The net effect is computed below to give a better explanation of the interacted terms. The computed net effect (Appendix C)shows that, in the short run, for each percentage increase in public debt, private consumption is reduced by 43.55% at the mean of direct tax. This implies that with increased public debt, an increase in direct taxes is likely to reduce the consumption level of consumers in the long run. This implies a huge consumer welfare reduction.

Similarly, table 9 reveals that, in the short run, public debt and indirect taxes jointly reduce private consumption by 0.030745 at a 10% significance

level. The net effect (Appendix C) also shows that, in the short run, for each percentage increase in public debt, private consumption is reduced by approximately 0.21%at the mean of direct tax. The implication is that, with increasing public debt, an increase in direct taxes is likely to further reduce the consumption level of consumers in the long run.

Table 10: Goodness of Fit of the Model

R-squared	0.974925	Mean dependent var	0.126862
Adjusted R-squared	0.941492	S.D. dependent var	6.426582
S.E. of regression	1.554489	Akaike info criterion	4.011369
Sum squared resid	36.24655	Schwarz criterion	4.935088
Log-likelihood	-51.20464	Hannan-Quinn critter.	4.333772
F-statistic	29.16044	Durbin-Watson stat	2.331425
Prob(F-statistic)	0.000000		

Source: Author (2022)

The regression as a whole is significant at the 1% level, as evidenced by the F-statistics probability value in Table 10. Furthermore, the table shows that the data used in the study is robust, with an adjusted R-squared of over 50% (approximately 98%), indicating a satisfactory statistical fit of the regression model to the data. The joint significance of the independent variables in the model is suggested by an F-statistic value of 29.16. The model does not suffer from first-order serial correlation, as indicated by the Durbin-Watson result of approximately 2.33, implying the absence of autocorrelation

Monetary policy channel through which public debt affects private consumption

In achieving the second objective of the study, the researcher analyzes the long and short-term results of the monetary policy channel through which public debt affects private consumption as below;

Test for cointegration

This session of the study seeks to examine the monetary policy channels through which public debt affects private consumption. To achieve this, it is imperative to test for the existence of a long-run equilibrium relationship between these variables within the framework of the bounds-testing approach to cointegration. The F-test is used to determine the existence or otherwise of cointegration among the variables in the long run. The results of the computed F-statistics when private consumption is normalized (that is, considered as a dependent variable) in the ARDL-OLS regression are presented in Table 7.

Table 11: Bound Test for Cointegration

F-Bounds Test		**Null Hypothesis: No levels of Relationship**		
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	6.793827	10%	2.38	3.45
k	7	5%	2.69	3.83
		2.5%	2.98	4.16
		1%	3.31	4.63
Actual Sample Size	36		Finite Sample: n=40	
		10%	2.668	3.92
		5%	3.121	4.564
		1%	4.31	5.965
			Finite Sample: n=35	
		10%	2.729	3.985
		5%	3.251	4.64
		1%	4.459	6.206

Note: k is the number of regressors used in the model.
Source: Author (2022)

Table 11 shows the presence of a long-term relationship between the variables involved in the equation. The F-statistics value of 6.793827 is higher than the upper bound critical value of 3.83 at the 5% level of significance. Hence, the null hypothesis of no cointegration is rejected, demonstrating that there is a stable long-term equilibrium connection among the variables (cointegration) included in the equation. This implies that there is a long-term relationship between the variables in the estimated model. The estimated coefficients for the long and short-run monetary policy channel through which public debt affects private consumption, are presented below;

Long run results of the monetary policy channel through which public debt affects private consumption

Table 12:Long Run Estimate Based on ARDL Approach

Variable	Coefficient	Std. Error	T-Statistic
PDT	-0.372517**	0.150723	-2.471542
INC	7.5308**	3.5008	2.152518
MPR	-0.683644**	0.258580	-2.643836
PDT#MPR	-1.174456	5.588910	-0.210140
GEX	-19.31544	14.96238	-1.290933
INF	8.181346*	4.589141	1.782762
REER	-0.117814	0.095637	-1.231891

Note. ***, ** and * indicate significance level at 1%, 5% and 10% respectively.
Source: Author (2022).

Table 12 presents the results of the monetary policy channel through which public debt affects private consumption. The table shows that in the long run, public debt reduces private consumption. This is indicated by its negative coefficient on private consumption. The results indicate that a percentage increase in public debt leads to a 0.37 reduction in private consumption at a 5% level of significance. Also, income and inflation have a positive relationship with private consumption in the long run at 5% and 10%

levels of significance respectively. Results in table 12 also show that, in the long run, an increase in monetary policy rate leads to a fall in private consumption level at a 5% significance level. Moreover, the table reveals that, in the long run, public debt and monetary policy rate jointly have a negative relationship with private consumption but the effect is insignificant.

The error correction model (ECM) that calculates the speed of adjustment to long-run equilibrium when there is any disequilibrium in the system in the short run as a result of shocks is given as:

EC = DPCS - (-0.3725*DPBT + 753256276.6470*DINC -

0.6836*DMPR

-1.1745*DPDMP -19.3154*DLGEX + 8.1813*DLINF -

0.1178*DREER)

Short-run results of the monetary policy channel through which public debt affects private consumption

Table 13: Estimated Short run ECM using the ARDL

Variable	Coefficient	Std. Error	T-Statistic
C	136.1471***	15.29465	8.901617
@TREND	-2.344843***	0.264176	-8.876064
D(PCS(-1))	-0.446106***	0.070474	-6.330105
D(PDT)	-0.116631***	0.034055	-3.424824
D(INC)	3.5908***	1.4908	0.000000
D(INC(-1))	-3.0508***	81510427	0.000000
D(MPR)	-0.220053**	0.081243	-2.708573
D(PDT#MPR)	3.505588	2.780485	1.260783
D(PDT#MPR (-1))	14.16332***	2.586754	5.475324
D(GEX)	7.064132**	2.739489	2.578631
D(GEX(-1))	24.70465***	3.953240	6.249217
D(INF)	3.765620***	0.735971	5.116537
D(INF(-1))	-3.299008***	0.541162	-6.096155
D(REER)	0.023205	0.029115	0.797023
ECM(-1)*	-0.948024***	0.104996	-9.029171

Note. ***, ** and * indicate significance level at 1%, 5% and 10% respectively.
Source: Author (2022).

In Table 13, the study outlines the short-term results of the monetary policy channel through which public debt affects private consumption. The analysis specifically focuses on the role of monetary policy rates in shaping the effect of public debt on private consumption. The results show that in the short run public debt has a negative significant impact on private consumption whiles income increases consumption significantly. Also, in the short run, an increase in monetary policy reduces private consumption by 0.22% at a 5% level of significance. It could be seen from the table also that, monetary policy rate and public debt have a positive insignificant relationship with private consumption. This may be because an increase in policy rate does not entice the ordinary consumer to give up his consumption to lend to the government as other investors may do. the table also reveal that, even though the joint effects of public debt and private consumption was positive, it was insignificant.

Table 14: Goodness of Fit of the Model

R- squared	0.843920	Mean dependent var	-0.384835
Adjusted R-Squared	0.609799	S.D. dependent var	4.114069
S.E of regression	1.366717	Akaike info criterion	35.003369
Sum Squared Resid	92.46115	Schwarz criterion	5.971075
Log Likelihood	-68.0604	Hannan-Quinn criteria.	5.341124
F-statistic	3.604638	Durbin-Watson stat	1.728466
Prob(F-statistic)	0.008529		

Source: Author (2022)

The regression analysis conducted in the study is highly significant, with a probability value of the F-statistic indicating significance at the 1% level. Table 14 also reveals the robustness of the data used, with an adjusted R-squared of above 50%, or approximately 84%, indicating a strong fit of the

regression model to the data. The F-statistic value of 3.60 suggests that the independent variables in the model are jointly significant. Additionally, the Durbin-Watson (DW) result of around 1.73 indicates that the model is not affected by first-order serial correlation or autocorrelation, which is further supported by the fact that the DW test statistic falls within the normal range of 1.5 to 2.5, as suggested by Field (2009) and Kumarasinghe et al. (2020).

The study also relies on the Breusch-Godfrey serial correlation Lagrange Multiplier (LM) test to check for serial correlation in all models. Additionally, the Breusch-Pagan Godfrey test is used to test for heteroscedasticity. Results are tabulated in Appendix A.

Model Stability Test

Lastly, Pesaran and Pesaran (1997) suggest using the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMQ) tests to assess the stability of both the long-run and short-run coefficients. These stability tests evaluate the consistency of the regression coefficients over time, indicating whether or not the regression equation remains constant. The null hypothesis is that the coefficient vector remains constant across all periods, while the alternative hypothesis is that it does not (Bahmani-Oskooee, 2004). The CUSUM and CUSUMQ statistics are plotted against the critical bound of 5% significance. If the plot remains within the critical bound, the null hypothesis cannot be rejected (Bahmani-Oskooee, 2004). The stability tests for both models, shown in Appendix C, demonstrate that all coefficients of the estimated model remain stable over the study period, as they fall within the 5% critical bounds.

Optimum Threshold Level Effects of Public Debt on Private Consumption

The discrete threshold regression is used to determine the optimum threshold effects of public debt on private consumption. Using the approach, a threshold level that divides the regression models into regimes above and below is determined. The results are indicated.

Table 15: Threshold Effects of Public Debt on Private Consumption

Variable	Coefficient	Std. Error	T -statistics
	DPBT<4.836103		
DPDT	-0.060922	0.045111	-1.350487
DINC	11877428*	7073851	1.679061
DGEX	-4.904471	6.275909	-0.781476
DREER	0.017262	0.022005	0.784497
	DPBT> 4.836103		
DPDT	-0.164070**	0.077459	-2.118168
DINC	50832717***	19243152	-2.641600
DGEX	-19.04759**	7.777754	-2.448983
DREER	0.002539*	0.001411	1.799401

Note. ***, ** and * indicate significance level at 1%, 5% and 10% respectively.
Source: Author (2022)

According to Table 11, the research findings demonstrate that there is a threshold for the public debt at around 4.836%, which confirms the presence of a linear relationship between public debt and private consumption in Ghana. The table shows that when public debt is below the level of 4.836% of GDP, it has a negative and insignificant effect on private consumption. However, when public debt is above the established threshold level, it has a negative and significant effect on private consumption. The results indicate that when public debt exceeds the threshold level of 4.84% of GDP, a 1% increase in

public debt leads to a reduction in private consumption by approximately 0.16% of GDP at a 5% level of significance.

Chapter Summary

The chapter looked at the empirical results of the role of fiscal and monetary policies in the effect of public debt on private consumption in Ghana. The chapter began examining the time series properties of the data used for the estimation. The unit root test employing the Zivot-Andrew technique showed that all the series were stationary at levels except for income, government expenditure, and domestic credit to the private sector by banks that had to be differenced once to achieve stationarity. In a similar vein, employing the breakpoint test for stationarity indicated that all the variables had to be differenced once to attain stationarity except government expenditure and inflation which were stationary at levels. The study further conducted the test for cointegration using the bounds testing approach. Also, a discrete threshold regression approach was employed to identify the optimum threshold effects of the fiscal and monetary policy channels through which public debt affects private consumption. Both the short-run and the long-run estimates reveal a negative effect of public debt on private consumption. However, both the short-run and long-run estimates indicate a positive effect of inflation on private consumption.

The coefficient of the error correction term is indicative of the fact that approximately 93% of all disequilibria from the preceding year's shock converge back to the long-run equilibrium in the existing year. In other words, the speed of adjustment is about 95% within a year. The diagnostic and parameter stability tests reveal that the model passed the test of serial

correlation, functional misspecification, normal distribution of data, and heteroscedasticity. The overall regression is also significant at both 1% and 10% as can be seen from the short-run and long-run estimate and the graph of the CUSUM and CUSUMQ plots indicate the stability of the coefficients estimated.

CHAPTER FIVE

SUMMARY, CONCLUSION, AND RECOMMENDATION

Introduction

This chapter summarizes the entire study. It presents a summary, conclusion, and recommendations derived from the analysis of the data collected. This chapter also presents the limitation and suggests a direction for further research.

Summary of the Study

The main objective of this study was to determine the role of fiscal and monetary policies in the effects of public debt on private consumption in Ghana by the use of time series data from the years 1983 to 2021. Specifically, the study sought to determine the effects of public debt on private consumption, examine the monetary and fiscal channels through which public debt affects private consumption, and also determine the optimum threshold level effects of public debt on private consumption in Ghana.

There was an adequate review of theoretical and empirical literature to help understand the topic better. There were gaps identified from the reviewed literature that this study sought to address. The gaps include scant research on the topic globally and its absence in Ghana particularly. The following variables were used in the analysis; Private Consumption (PC), Public Debt (PDT), Income (INC), Direct Tax (DRTX), Indirect tax (INDTX), Monetary Policy Rate (MPR), Government Expenditure (GEX), Inflation (INF), and Real Effective Exchange Rate (REER).

The unit roots tests were conducted on the variables and the results for both the Zivot-Andrew and the Breakpoint tests show that the variables are

cointegrated of I (0) or I (1). It was ensured that none of the variables was off I (2) to avoid the problem of spurious results. The cointegration was also conducted which is the bound test that suggested the ARDL model. The coefficients for the long-run and short-run were then estimated. To examine the long-run relationship and short-run dynamic parameters of the model, the Autoregressive Distributed Lag (ARDL) model was employed. Also, to estimate the threshold level of fiscal and monetary policy channels, the study employed the Threshold regression method.

Summary of Findings

The findings of the entire study are summarized below;

1. The cointegration analysis revealed that there is a negative significant relationship between public debt and private consumption in Ghana. The long-run equation revealed that a percentage increase in public debt leads to a decrease in the level of private consumption. Consistent with the long-run estimate, public debt maintained its relationship with private consumption level in the short run.
2. The findings of the study also revealed that, through direct and indirect taxes, an increase in public debt significantly reduces private consumption in the short run.
3. The study also ound that, public debt does not have a significant effects of private consupution throung monetary policy in both the long run and short run.
4. Below the threshold level of 4.836% o GDP, public debt has an insignificant impact on private consumption but beyond the threshold

level, public debt begins to cause a reduction in the consumption levels of the consumers.

Conclusion

In conclusion, this study highlights the effects of public debt on private consumption in Ghana. The findings indicate that, a negative significant relationship between public debt and private consumption in both the short run and the long run. The study shows that, in the presence of direct taxes, indirect taxes, and monetary policy rates, the negative private consumption effects of public debt are worsened. The study also shows that public debt has an insignificant impact on private consumption below the threshold level of 4.836 but beyond this level, public debt causes a reduction in the consumption levels of the consumers.

Policy Recommendation

Based on the study's findings, policy recommendations aimed at reducing the negative impact of public debt on private consumption in Ghana include:

1. Government should reduce borrowing by implementing strict fiscal discipline to ensure that government spending is aligned with revenue generation. This may involve reducing non-essential expenditures and improving revenue collection
2. The government should explore alternative sources of revenue such as natural resource rents. This will help reduce the reliance on direct taxes reduces private consumption.
3. Government should ensure that public debt remains within sustainable limits (i.e, below the established threshold level of 4.836% of GDP).

This can be achieved through prudent borrowing, debt management, and budgetary discipline.

Direction For Future Research

Based on the findings of this study, below are some avenues for future research

1. Analyze the effectiveness of government policies designed to manage public debt levels and their impact on private consumption in Ghana.
2. Investigate the role of international institutions such as the IMF and World Bank in managing public debt and their impact on private consumption in Ghana.
3. Examine the effects of public debt on different income groups in Ghana to determine if there are significant distributional effects.

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APPENDICES

APPENDIX A

DIAGNOSTIC AND STABILITY TESTS

Ramsey RESET Test for Model Specification

	Model 1		
	Value	**df**	**Probability**
T stats	0.756340	17	0.4598
F stats	0.572050	(1, 17)	0.4598
Likelihood ratio	1.191464	1	0.2750
	Model 2		
	Value	**df**	**Probability**
T stats	1.360452	5	0.8453
F stats	1.850831	(1, 5)	0.5933
Likelihood ratio	11.33755	1	1.0000
	Model 3		
	Value	**df**	**Probability**
T stats	1.289635	13	0.2196
F stats	1.663159	(1, 13)	0.2196
Likelihood ratio	4.333997	1	0.0374

Serial correlation Test using Breusch-Godfrey Serial Correlation LM Test

	Model 1		
F stats	0.012813	Prob. F(2,16)	0.9873
Obs*R-squared	0.057568	Prob. Chi-Square(2)	0.9716
	Model 2		
F stats	12.31062	Prob. F(2,4)	0.9718
Obs*R-squared	30.96877	Prob. Chi-Square(2)	0.0000
	Model 3		
F stats	3.592050	Prob. F(2,12)	0.9777
Obs*R-squared	13.48135	Prob. Chi-Square(2)	0.0012

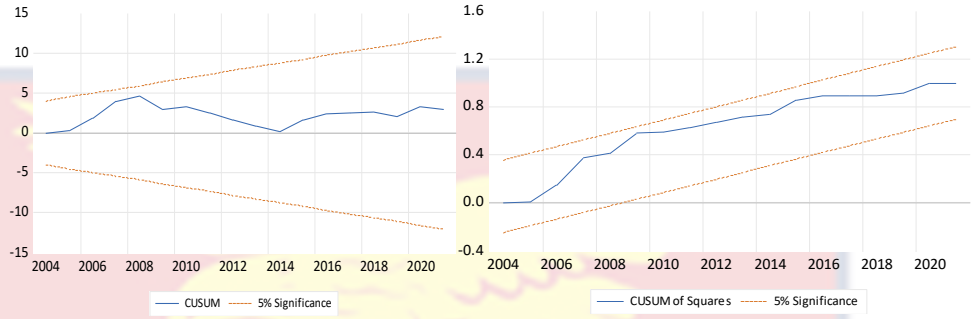
Heteroscedasticity Test using Breusch-Pagan-Godfrey

Model 1			
F stats	1.456902	Prob. F(17,18)	0.2179
Obs*R-squared	20.84825	Prob.Chi-square (17)	0.2332
Scaled explained SS	2.403773	Prob.Chi-square (17)	1.0000
Model 2			
F stats	0.585489	Prob. F(29,6)	0.8453
Obs*R-squared	26.60019	Prob. Chi-Square(29)	0.5933
Scaled explained SS	0.834578	Prob. Chi-Square(29)	1.0000
Model 3			
F stats	1.493671	Prob. F(21,14)	0.2223
Obs*R-squared	24.89063	Prob. Chi-Square(21)	0.2519
Scaled explained SS	2.945580	Prob. Chi-Square(21)	1.0000

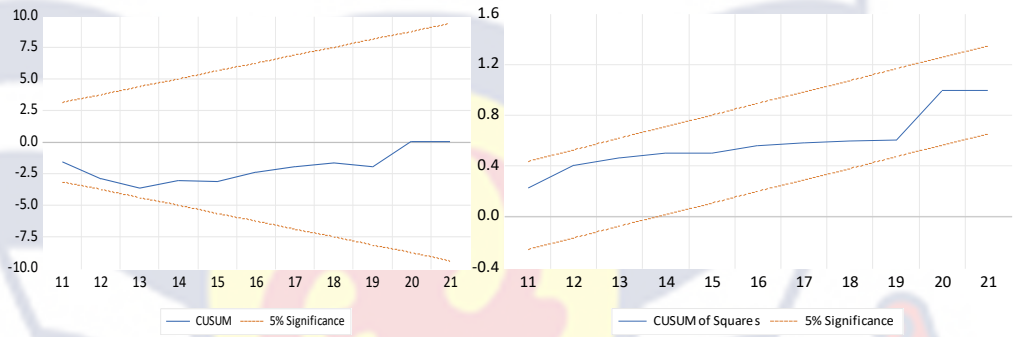
APPENDIX B

A plot of the Cumulative Sum of Recursive Residuals (CUSUM)

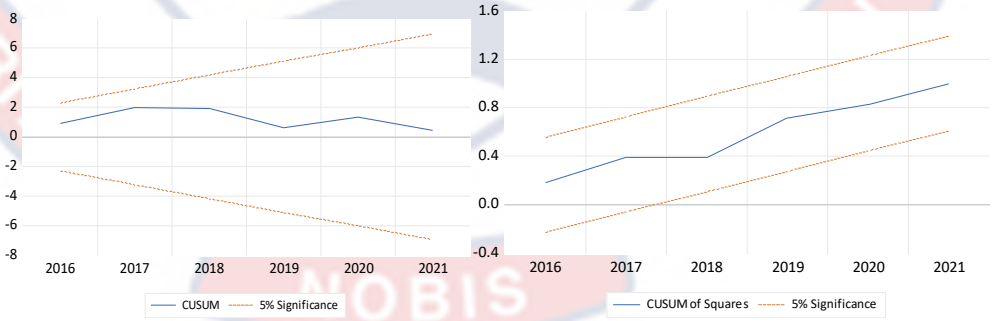
Model 1



Model 2



Model 3



APPENDIX C

NET EFFECT OF PUBLIC DEBT AND FISCAL POLICIES (DIRECT AND INDIRECT TAX) ON PRIVATE CONSUMPTION IN THE SHORT RUN

$$\frac{\Delta(DPCS_t)}{\Delta(\Delta PBT_T)} = \beta_2 + \beta_3 \overline{FISCAL\ POLICY_t}$$

$$\frac{\Delta(DPCS_t)}{\Delta(\Delta PBT_T)} = \beta_2 + \beta_3 \overline{DIRECT\ TAX_t}$$

$$\frac{\Delta(DPCS_t)}{\Delta(\Delta PBT_T)} = -0.09414 + (-9.655583)\ (\overline{DIRECT\ TAX_t})$$

Placing the mean value of direct tax from the descriptive statistics gives;

$$\frac{\Delta(DPCS_t)}{\Delta(\Delta PBT_T)} = -0.09414 - 9.655583\ (4.501)$$

$$\frac{\Delta(DPCS_t)}{\Delta(\Delta PBT_T)} = -43.55$$

$$\frac{\Delta(DPCS_t)}{\Delta(\Delta PBT_T)} = \beta_2 + \beta_3 \overline{FISCAL\ POLICY_t}$$

$$\frac{\Delta(DPCS_t)}{\Delta(\Delta PBT_T)} = \beta_2 + \beta_3 \overline{INDIRECT\ TAX_t}$$

$$\frac{\Delta(DPCS_t)}{\Delta(\Delta PBT_T)} = -0.09414 - 0.030745 \overline{INDIRECT\ TAX_t}$$

Placing the mean value of indirect tax of 3.747 from the descriptive statistics gives;

$$\frac{\Delta(DPCS_t)}{\Delta(\Delta PBT_T)} = -0.09414 - 0.030745(3.747)$$

$$\frac{\Delta(DPCS_t)}{\Delta(\Delta PBT_T)} = -0.2093$$